

USSR

UDC 621.373.521.1:621.382.233

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BOBROVSKIY, YU. L., BOL'SHAKOVA, N. P., OBCHINNIKOV, K. D., TSUKER, M. S.

"Superhigh Frequency Tunnel Diode Generator with a Wide Mechanical Tuning Band"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 2 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 2), Leningrad, 1970, pp 204-207 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D261)

Translation: The results of an experimental investigation of a superhigh frequency tunnel diode generator with a wide range of mechanical tuning are presented. The applicability of the quasilinear approximation for calculating the output power is demonstrated. There are two illustrations and a two-entry bibliography.

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UDC 621.355.2.035.24

DESSONOVA, T. M., BOL'SHAKOVA, H. V., ZHIVOTINSKIY, P. B.

"Variation of the Structure of Porous Plates of Lead Batteries during Operation"

Sb. rabot po khim. istochnikam toka. H.-i. akkumulyator. in-t (Collected Works on Chemical Current Sources. Scientific Research Battery Institute), 1971, vyp. 6, 28-34 (from RZh-Khimiya, No 6 (II), Jun 72, Abstract No 6L243)

Translation: The variations in volumetric porosity, diameters and the coefficient of convolution of the pores and also the gas filling of the positive and negative plates during charge and discharge of starter lead batteries with different assembly density are defined.

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Rubber and Elastomers

USSR

UDC 541.15

BOLESHAKOVA, S. I., KUZ'MINSKIY, A. S., Scientific Research  
Institute of the Rubber Industry, Moscow

"The Role of Charges in Radiochemical Changes in Rubber"

Moscow, Khimiya Vysokikh Energiy, Vol 5, No 6, Nov-Dec 71,  
pp 509-514

Abstract: The article describes results of a study of the effect of additives of the electron-donor type (phenyl- $\beta$ -naphthylamine) and electron-acceptor type (chloranil), as well as their combinations on the radiolysis of some rubbers (polybutadiene-nitrile rubber and cis-polybutadiene rubber). Specimens were irradiated with Co-60 gamma rays at a dose rate of 1 Mrad/hr and temperatures of 77 and 300°K. The principal study of the structure and properties of the stabilized paramagnetic centers was performed by the EPR method. Electron spectra and luminescence excitation spectra of the irradiated specimens were also studied. Structural changes in the material were judged from the formation of molecular bonds, studied by the equilibrium swelling method. In rubbers irradiated at 77°K stabilized electrons and ion radicals of the additives  
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BOL'SHAKOVA, S. I., et al, Khimiya Vysokikh Energiy, Vol 5, No 6, Nov-Dec 71, pp 509-514

were observed along with the rubber radicals. Addition of ion acceptors, without changing the total number of stabilized paramagnetic centers, determines chemical changes in rubber as a result of radiolysis. Thus, an electron acceptor and a combination of electron-donor and electron-acceptor additives sensitize the formation of molecular bonds in the rubbers, while an electron donor protects the rubbers against radiation effects. Evidently sensitization of cross-linking in electron capture by the additive molecule is the result of an ion-molecular reaction with the participation of double bonds of the rubber molecule.

The excitation luminescence spectra were studied on the device of the Institute of Chemical Physics, Academy of Sciences USSR, and the authors thank V. V. KULAKOV for staging the experiment. The authors also thank V. G. NIKOL'SKIY for discussing the results.

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USSR

UDC 541.15

BOL'SHAKOVA, S. I., SHASHKOV, A. S., DEGTEVA, T. G., KUZ'MINSKIY, A. S.,  
Scientific Research Institute of Rubber Industry, Moscow

"NMR-Study of Structural Changes in Rubber During Low-Temperature Radiolysis"

Moscow, Khimiya Vysokikh Energii, Vol 5, No 4, Jul-Aug 71, pp 361-362

Abstract: An attempt was made to determine the radiolysis and ion excitation effects of primary reactions occurring during the irradiation and of those of the stabilized portion of active forms which disappear when molecular mobility is restored in the  $\beta$ - or  $\gamma$ -relaxation area. The nuclear magnetic resonance (NMR) method was used to ascertain chemical changes in butadiene-nitrile rubber during low-temperature radiolysis, using a JNM-3 spectrometer at a maximum of 35 Mrad. One table and one figure are used to illustrate the formation of additional chemical bonds leading to closer packing of macro-molecules when the test rubber was brought back to room temperature, thus changing the properties of the material.

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BOL'SHEV, A. I.

"Spectra of Binary Cyclical Codes"

Informatsionnye Materialy. Nauch. Sovet po Kompleks. Probl. "Kibernetika" AN SSSR [Information Materials, Scientific Council on the Complex Problem of "Cybernetics," Academy of Sciences USSR], No 3(50), 1971, pp 15-22, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V371 by V. Zinov'yev).

Translation: The problem of determination of the weighted spectrum in a binary cyclical  $(n, k)$  code with odd  $n$  is studied. Suppose  $g(x)$  and  $h(x)$  are the generating and test polynomials of this code and  $h(x) = p_1(x) \cdot p_2(x) \dots p_s(x)$  is its expansion into irreducible cofactors. Suppose  $A$  is a set of polynomials of power less than  $k$ , mutually prime with  $h(x)$ . Code words of the form  $a(x) \cdot g(x)$ , where  $a(x) \in A$ , will be referred to as the natural words of the code. A theorem is produced, reducing analysis of the weighted structure of the code to the corresponding analysis of the set of natural words of each of the cyclical subcodes of this code. Set  $A$  forms an Abelian group relative to the multiplication of polynomials in mod  $h(x)$

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BOL'SHESOL'SKIY, P. P. and AMONOV, V. P.  
"Nonlinear Correction Device"

APPROVED FOR RELEASE: 09/01/2001, CIA-RDP86-00513R002200420012-8"

USSR Author's Certificate No 287158, filed 22 Jan 69, published 14 Jan 71 (from RZh-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No. 12, 1971, Abstract No. 12A155P)

Translation: The proposed device can be used in deviation automatic control systems. Known correcting devices contain parallel-connected capacitors and resistors. Correcting devices of this type do not provide adequate control quality in a broad range of controlled quantity variation. The proposed correcting device is distinguished from the known systems in that it contains 2 oppositely connected stabilitrons at the input, which are connected in series with a scaling resistor and shunted to the zero potential bus by an additional resistor, the scaling resistor being made in the form of series-connected resistors whose connecting point is tied to the zero potential bus through an additional circuit containing a resistor and a connected diode. These differences raise the quality of the control because of the automatic change in the control law depending on the input signal level, thus stabilizing the operating threshold of the control circuit.

Resume  
1/1

USSR

BOL'SHEV, A. I., Informatsionnye Materialy. Nauch. Sovet po Kompleks. Probl. "Kibernetika" AN SSSR, No 3(50), 1971, pp 15-22.

Abstractors Note. Another method of analysis of the weighted spectrum, leading to complete solution of the problem, was suggested in the work of Oganessian, S. Sh. and Yagdzhyan, V. G. (RZhMat, 1971, 4V508). Both of these works were presented at the Third Symposium on the Use of Redundancy in Information Systems (Leningrad, 17-22 June, 1968), theses of reports, 24-26, 29-30. Analysis of the weighted structure of cyclical codes over arbitrary Galois fields  $GF(q)$  was recently suggested (RZhMat, 1972, 1V718).

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BOL'SHEV, A. I., Informatsionnye Materialy. Nauch. Sovet po Kompleks. Probl. "Kibernetika" AN SSSR, No 3(50), 1971, pp 15-22.

of order  $\phi(h) = (2^{m_1} - 1)(2^{m_2} - 1) \dots (2^{m_s} - 1)$ , where  $m_i$  is the power of  $p_i(x)$ . In group  $A$ , elements  $1, x, \dots, x^{n-1} \pmod{h(x)}$  forms subgroup  $\{1\}$  of index  $\delta = \phi(h)/n$ . Therefore, the cyclical representatives of the set of natural words of the code are representatives of neighboring classes in the expansion of  $A$  with respect to  $\{1\}$ . It is rather simple to find these representatives if factor group  $A/\{1\}$  is a cyclical group, which occurs when  $\delta$  is free of squares. Another approach is also suggested to analysis of the spectrum of natural words. Suppose  $r(x)$  is the remainder from division of  $g(x)$  by  $h(x)$ .

The following theorems are proven: 1. If  $a(x) \in A$  generates a cycle, then  $a^2(x) \cdot r(x)$  generates a cycle of the same weight. 2. Polynomial  $r^{-1}(x)g(x)$ , where  $r^{-1}(x)r(x) \equiv 1 \pmod{h(x)}$ , is the item potent of this code. 3. The summary weight of the set of representatives of cycles of natural words of the code is equal to  $(\phi(h) + (-1)^{s-1})/2$ .

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UDC: 51:621.391

BOL'SHEV, A. I.

"Codes With Predetermined Symmetry (Permutable Codes)"

V sb. 4-y Simpozium po probl. izbytochn. v inform. sistemakh. Dokl. Ch. 1  
(Fourth Symposium on Problems of Redundancy in Information Systems. Reports,  
Part 1), Leningrad, 1970, pp 48-55 (from RZh-Kibernetika, No 1, Jan 71,  
Abstract No 1V408)

Translation: The symmetry group of a code is defined as the group of permutations with respect to which the code is invariant when they act on the set of code words. In this paper, the author considers permutable codes, i. e. binary group codes whose symmetry groups are generated by arbitrary permutations. Associated with each permutation  $\pi$  is a linear operator  $X$  on a set of  $n$ -dimensional binary vectors, this operator being given by the corresponding permutation of code symbols. The set of operators forms a commutative ring  $R[X]$ . The method of multiplying the elements of ring  $R[X]$  by the  $n$ -dimensional binary vectors of space  $V$  simultaneously with the commutative law acting on  $V$  is determined by the left unitary  $R[X]$ -module, which is designated  $V_\pi$ . Corresponding to each permutable  $(n, k)$  code is a submodule of  $R[X]$ -module  $V_\pi$ , where the structure of the module and its submodules is

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USSR

BOL'SHEV, L. N.

"Applications of Empirical Bayes Approach"

Mezhdunar. Kongress Matematikov v Nitstse 1970 [International Congress of Mathematicians in Nitstse, 1970 -- Collection of Works], Moscow, Nauka Press, 1972, pp 48-55 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V184 by V. Pagurova).

Translation: This report is dedicated to estimation of the effectiveness of acceptance testing from the standpoint of the empirical Bayes approach. Let  $N$  be the volume of a group of products tested,  $n$  be the volume of the sample,  $X$  and  $Y$  be the number of defective products in the sample and the production group respectively and suppose the conditional distribution of  $X$  with fixed  $Y$  follows a hypergeometric distribution. A system of inequalities is produced for the unknown conditional mathematical expectations of the share of defective products (sdp) among products not belonging to the sample with fixed  $X$ . The estimate for the mean sdp in the groups accepted corresponds to the approximate value, which follows from the non-Bayes theory of Kolmogorov. Inequalities are similarly produced for the dispersion of the sdp in the groups accepted. Examples are presented and statistical conclusions are reached.

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1/2 016

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--CALCULATION OF THE INTENSITY OF INFECTION WITH TICK BORNE  
ENCEPHALITIS IN THE POPULATION OF ZABAISKALIE -U--  
AUTHOR--(05)--GORIN, G.Z., LVOV, D.K., VASENIN, A.A., BOLSHEV, L.N.,  
KRUCNIC, YU.I.  
COUNTRY OF INFO--USSR

SOURCE--MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI, 1970, VOL  
39, NR. 3, PP 259-263  
DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ENCEPHALITIS, TICK, SEROLOGIC TEST, HEMAGGLUTINATION  
INHIBITION TEST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/0222

STEP NO--UR/0358/70/039/003/0259/0263

CIRC ACCESSION NO--AP0123986

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE—30OCT70

CIRC ACCESSION NO--AP0123986

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ON THE BASIS OF PREVIOUSLY PUBLISHED METHODS BY THE AUTHORS CALCULATION OF THE INTENSITY OF INFECTION RATE OF THE POPULATION WITH TICK BORNE ENCEPHALITIS IN THE ZABAICALIE WAS MADE, AS WELL AS CALCULATION OF THE INFECTION RATE OF TICKS WITH THE VIRUS (9-13PERCENT). THE ANALYSIS WAS BASED ON THE DATA OF SEROLOGICAL EXAMINATION OF 6420 PERSONS BY THE HI TEST, AS WELL AS ON THE DATA OF QUESTIONING OF 26,781 SUBJECTS WITH REGARD TO TICK EXPOSURE AND ATTACK DURING THE EPIDEMIC SEASON. SPECIMENS WERE COLLECTED IN 1966-1968 IN THE CHITA REGION AND THE BURYAT ASSR. ACCORDING TO INTENSITY OF INFECTION, IT WAS FOUND POSSIBLE TO COMBINE TERRITORIES SITUATED IN DIFFERENT PHYSICO GEOGRAPHICAL AND LANDSCAPE CONDITIONS INTO 2 MAIN LANDSCAPE EPIDEMIOLOGICAL AREAS. ONE OF THEM IS DISTINGUISHED BY AN EXTREMELY LOW INTENSITY OF INFECTION (0.4-0.9PERCENT) AND INCLUDES CENTRAL ASIAN AND THE PRISELENGINSKAYA STEPPE AND NORTH ZABAICAL MOUNTAIN TAIGA. THE OTHER AREA HAS HIGHER INTENSITY OF INFECTION (2-2.1PERCENT) AND INCLUDES TERRITORIES WITHIN THE DAURSKAYA MOUNTAIN TAIGA AND SUBTAIGA AS WELL AS THE PRIBAIKAL AND SOUTH ZABAICAL TAIGA AND SUBTAIGA. FACILITY: IRKUTSKIY INSTITUT EPIDEMIOLOGII I MIKROBIOLOGII, MZ RSFSR. FACILITY: INSTITUT VIRUSOLOGII IM D. I. IVANOVSKOGO, AMN SSSR. FACILITY: MOSKVA MATEMATICHESKIY INSTITUT IM. V. A. STEKLOVA, AN SSSR. FACILITY: MOSKVA REPUBLIKANSKAYA SANEPIDSTANTSIIYA, BURYATSKOY ASSR, ULAN-UDE.

UNCLASSIFIED

USSR

UDC 616.988.25:313.13(571.55)

GORIN, O. Z., L'VOV, D. K., VASENIN, A. A., BOL'SHEV, L. N., KRUOPIS, Yu. I., and KORYAKOVTSOVA, K. M., Irkutsk Institute of epidemiology and microbiology, Ministry of Health RSFSR, Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow, Mathematics Institute imeni V. A. Steklov, Academy of Sciences USSR Moscow, and Republic Sanitary Epidemiological Station, Buryatskaya ASSR, Ulan-Ude

"Calculating the Intensity of Infection With Tickborne Encephalitis of the Population of Zabaykal'"

Moscow, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 39, No 3, May/Jun 70, pp 259-263

Abstract: The intensity of infection of the population with tickborne encephalitis in the Zabaykal' was calculated, and also the rate of infection of ticks with the virus (9-13%). The analysis was based on data of serological examination of 6,420 persons by the hemagglutination test, and on data from questioning of 26,781 subjects about their exposure to tick and attacks by ticks during the epidemic season. Specimens were collected in 1966-1968 in Chitinskaya Oblast and the Buryatskaya ASSR. According to the intensity of infection, it was possible to combine the territories situated in different physical geographical and land-  
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USSR

GORIN, O. Z., et al, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 39, No 3, May/Jun 70, pp 259-263

scape conditions into two main landscape-epidemiological areas. One of these areas, distinguished by an extremely low intensity of infection (0.4-0.9%), includes the Central Asian and Priselenginskaya steppes and the North Zabaykal mountain taiga. The other area, with higher intensity of infection (2-2.1%), includes the territories within the Dauriskaya mountain taiga and subtaiga, as well as the Pribaykal and South Zabaykal taiga and subtaiga.

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USSR

UDC 621.315.592:546.19'681

SOKOLOV, YE.B., BOL'SHEVA, YU.N., LOGINOVA, L.V., MIL'VIDSKIY, M.G.

"Behavior Of Copper During Melting Of Gallium Arsenide To A Flux"

Sb.nauch.tr. po probl. mikroelektron. Mosk. in-t elektron.tekhn. (Collection Of Scientific Works On Problems Of Microelectronics. Moscow Institute Of Electronics Technology), 1972, Issue 8, pp 109-112 (from RZh:Elektronika i yeye primen- iye, No 9, Sept 1972, Abstract No 9B106)

Translation: The behavior is considered of one of the most studied impurities--copper at the boundary of melts of gallium arsenide--boric anhydride. It is assumed that with equilibrium of these two melts it is possible for extraction of the impurities in the flux to take place. It is shown that with high concentrations of copper (and copper oxide) in the melt, it is possible to disregard extraction of boric anhydride in the melt. 4 ref. Summary.

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USSR

UDC 535.37:621.375.8

BOL'SHOV, M. A., GUZEYEV, I. D., ZYBIN, A. V., KOLOSHNIKOV, V. G., MAYOROV, I. A., NEDLER, V. V., MANDEL'SHTAM, S. L., TIMOFEYEV, Ye. F., and FILIMINOV, L. N.

"Determining Small Na Concentrations by the Fluorescence Resonance Method Using Tunable, Pulsed Dye Lasers"

Minsk, Zhurnal Prikladnoy Spektroskopii, November 1973, pp 821-824

Abstract: The subject of this article involves the method of fluorescence resonance in the use of tunable radiation dye lasers for detecting small concentrations of elements. Experiments designed to demonstrate the possibilities of this method in the saturation mode of resonance transition with Na as the element to be detected are described. For the excitation of the Na vapor a rhodamine laser of the 6Zh type, pumped by the second harmonic radiation of a neodymium laser, was employed. The duration of the pulses was  $2 \cdot 10^{-8}$  sec, their power was  $10^5$  W, the width of the fluorescence line was 1 Å, and the tunable range 5600-6200 Å, with an interval of 20-30 sec between scintillations. The ZMR-3 was used as receiver. A block diagram of the equipment is given, together with a curve for the amplitude of the 1/2

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USSR

BOL'SHOV, M. A., et al., Zhurnal Prikladnoy Spektroskopii, November 1973,  
pp 821-824

fluorescence signal varying with time. The authors find that using a laser  
with high scintillation repetition rates and increasing the light power  
increase the sensitivity of the element detection.

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USSR

AKHMANOV, S. A., et al, Pis'ma v Zhurnal eksperimental'noy i teoreticheskoy fiziki, No. 11, 5 Dec 70, pp 547-551

investigated previously. The experiments on induced Raman scattering in self-focusing media were made with the second harmonic of a neodymium laser in single-mode and synchronization mode operation. Anomalous broadening of the spectrum reaching  $1000\text{ cm}^{-1}$  in nanosecond pulses and more than  $1000\text{ cm}^{-1}$  in picosecond pulses were observed in carbon bisulfide in a collimated beam. It is shown that the broadening of the spectrum of picosecond pulses in these experiments was directly associated with phase self-modulation of the pulse in a nonlinear medium.

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Acc. Nr:

APC038021

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 1, pp 3-13

ANOMALOUS BROADENING OF SPECTRAL LINES  
IN NONLINEAR LIQUIDS AND ITS EFFECT ON STIMULATED  
SCATTERING PROCESSES

Bol'shov, M. A.; Venkin, G. V.; Zhilkin, S. A.; Nurminskiy, I. I.

Results of an experimental investigation of the spectral structure of laser radiation passing through a self-focussing liquid are reported. For complete isolation of the generator from the scattering medium the second harmonic of a neodymium laser is employed as radiation source. The generator can operate under incoherent mode or mode-locked conditions. The spectral structure of the radiation was investigated in the direction of the incident light as well as at an angle of  $180^\circ$ . Broadening of a quasicontinuous nature and broadening involving a set of discrete lines, the distance between which was, as a rule, not related to the incident radiation spectrum, are recorded. An analysis of the experimental results shows that the spectral line broadening may be ascribed to interaction between space and time modulation of the beam during its self-focussing.

REEL/FRA  
19731061

21

AP0038021

Some data pertaining to stimulated combinational scattering under conditions of anomalous broadening of a laser pulse spectrum are reported. In particular the strong sensitivity of the scattering indicatrix to modulation of the initial radiation is noted.

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19731062

USSR

B  
UDC:621.313.12:539.172.12

BOL'SHOV, V. I., DUBININ, A. A., DMITRIYEV, V. M., KAPCHIGASHEV, S. P., KON'SHIN, V. A., MATUSEVICH, YE. S., POLIVANTSEY, V. P., PUPKO, V. Ya., REGUSHEVSKIY, V. I., STAVISSKIY, Yu. Ya., and YUR'YEV, Yu. S.

"Physical Investigation of the Target in an Electronuclear Neutron Flux Generator"

Moscow, Atomnaya Energiya, Vol 28, No 5, May 70, pp 388-392

Abstract: Fluxes of thermal neutrons on the order of  $10^{17}$ - $10^{18}$  n/cm<sup>2</sup>·sec open new possibilities for investigations in many areas of science and technology. There is great interest in the study of the possibility for increasing neutron fluxes by using the process of multiple neutron birth upon interaction of nucleons with energies in the hundreds of MeV with heavy nuclei. This article presents the results of experiments and calculations concerning the neutron-physical characteristics

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BOL'SHOV, V. I., DUBININ, A. A., DMITRIYEV, V. M., KAPCHIGASHEV, S. P., KON'SHIN, V. A., MATUSEVICH, Y. E. S., TOLIVANSKIY, V. P., TUPKO, V. Ya., REGUSHEVSKIY, V. I., STAVISSKIY, Yu. Ya., YUR'YEV, Yu. S., Moscow, Atomnaya Energiya, Vol 28, No 5, May 70, pp 388-392

of the target in an electronuclear device for the generation of neutron fluxes. The yield of neutrons and distribution of the number of reactions in a heavy target and moderator are measured. The space-energy distribution of neutron flux in the moderator is calculated and the accumulation of transuranium elements in a system with high neutron flux is computed.

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1/2 017  
UNCLASSIFIED  
TITLE--PHYSICAL STUDIES OF THE TARGET OF AN ELECTRONUCLEAR NEUTRON FLUX  
PROCESSING DATE--27NOV70  
GENERATOR -U-  
AUTHOR--BOLSHOV, V.I.  
COUNTRY OF INFO--USSR  
SOURCE--AT. ENERG. 1970, 28(5), 388-93  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--NEUTRON FLUX, SYNCHROCYCLOTRON, NEUTRON ENERGY DISTRIBUTION,  
HALF LIFE, CAPTURE CROSS SECTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3008/0595  
STEP NO--UR/0089/70/028/005/0388/0393  
CIRC ACCESSION NO--AP0137680  
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0137680

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS ARE PRESENTED ON THE CHARACTERISTICS OF TARGETS FOR GENERATING N AT THE OIYAI SYNCHROCYCLOTRON USING P OF 660 MEV. THE P BOMBARD EITHER A PB BLOCK OR A WATER TANK CONTG. A PB TARGET. THE TOTAL N YIELD WAS OF 11 PLUS OR MINUS 2 N-P FOR A TARGET 30 CM LONG AND 11.2 CM IN DIAM. MAX. TOTAL N FLUX FOR THE P BEAM OF 1 P-SEC WAS OF 1.8 TIMES 10 PRIME NEGATIVE 2 N-CM PRIME 2 SEC. SPATIAL ENERGY DISTRIBUTIONS OF N IN ZR HYDRIDE AND ZR DEUTERIDE AS MODERATORS WERE DETD. WITH THE N BEAMS AVAILABLE, HALF LIVES AND N CAPTURE CROSS SECTIONS WERE MEASURED.

UNCLASSIFIED

USSR

UDC 532

BOL'SHOV, V. P.

"Steady-State Method of Studying Diffusion in Liquids"

V sb. Diffuziya v gazakh i zhidkostyakh (Diffusion in Gases and Liquids -- Collection of Works), Alma-Ata, 1972, pp 86-91 (from RZh-Fizika, No 1, Jan 73, Abstract No 1Ye122)

Translation: An installation for measuring the diffusion coefficient in a liquid by the steady-state method is described. Diffusion is carried out through a porous membrane washed by a slow flow of the liquid being studied. The concentration was measured with a Pulfrich refractometer. The constant of the device was determined on the basis of known diffusion coefficient data. The diffusion coefficient of glycerin and ethylene glycol in water at 25°C was measured. 11 ref. P. Ye. Suyetin.

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172 038 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--OPTICAL PROPERTIES OF CUBIC NIOBIUM, TITANIUM ALLOYS IN THE VISIBLE  
AND NEAR INFRA RED SPECTRUM -U-  
AUTHOR-(02)-BOLSHOVA, K.V., LEKSINA, I.YE. **B**  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, APR. 1970, 29, (4), 777-781  
DATE PUBLISHED---APR 70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--NIOBIUM ALLOY, TITANIUM ALLOY, LIGHT TRANSMISSION, DIELECTRIC  
CONSTANT, ALLOY COMPOSITION, CRYOGENIC PROPERTY, ENERGY BAND STRUCTURE,  
CRYSTAL ORIENTATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3003/0450 STEP NO--UR/0126/70/029/004/0777/0781  
CIRC ACCESSION NO--AP0129675  
UNCLASSIFIED

2/2 038

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129675

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE OPTICAL PROPERTIES OF Nb,Ti ALLOYS OF A WIDE RANGE OF COMPOSITIONS WERE STUDIED IN THE VISIBLE AND NEAR INFRA RED SPECTRUM (0.4-2.5 MU M) AND THE RESULTS WERE INTERPRETED IN TERMS OF THE LIGHT TRANSMISSION AND DIELECTRIC CONSTANT AT 77-300DEGREESK. AS IN THE CASE OF PURE Nb, THESE PARAMETERS HAD SINGULARITIES ASSOCIATED WITH INTERBAND TRANSITIONS CLOSE TO THE (110) BRAGG PLANES; THE CORRESPONDING BANDS WERE NOT PARTICULARLY DEPENDENT ON COMPOSITION AND TEMP. THE ALLOYS ALSO EXHIBITED A NUMBER OF NEW BANDS NOT FOUND IN PURE Nb; THESE APPEARED MOST SHARPLY AT LIQUID N TEMP., AND WERE ATTRIBUTED TO TRANSITIONS CLOSE TO THE (100) AND (111) PLANES.

UNCLASSIFIED

USSR

UDC 669.017:[537+535]

BOL'SHOVA, K. V., and LEKSINA, I. YE., Physics Institute imeni P. N. Lebedev

"Optical Properties of Cubic Nb-Ti Alloys in the Visible and Infrared Spectrum"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 29, No 4, Apr 70, pp 777-781

Abstract: The optical constants  $n$  and  $\chi$  ( $n-i\chi$  --index of refraction) of electrolytically polished samples of cubic beta-solution Nb-Ti alloys (25, 52, and 85 at % Nb) at room temperature and at the temperature of liquid nitrogen were measured in the 0.40-2.6 micron region of the spectrum. On the basis of these data and the characteristics of conductivity of electrons of the indicated alloys, values of light conductivity and dielectric permeability associated with interzone transitions were obtained.

It was established that the main band in light conduction and the region of anomalous dispersion corresponding to it, were the same for the investigated alloys as for pure Nb in the region of 2-3 ev, and were associated with interzonal transitions near the Bragg plane  $\{110\}$ . The position and width of this band have little dependence on the alloy concentration and temperature.

In addition, for alloys, in comparison with pure Nb, a new series of bands was found whose presence is a function of alloy composition. These bands are more evident at the liquid nitrogen temperature. A hypothesis was made that the appearance of the new bands can be linked with interzonal transitions close to the Bragg  $1/2$

USSR

BOL'SHOVA, K. V., and LEKSINA, I. YE., Fizika Metallov i Metallovedeniye, Vol 29,  
No 4, Apr 70

planes  $\{100\}$  and  $\{111\}$ .

The authors thank G. P. Motulevich for his assistance.

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USSR

UDC 543.01:546.76:546.681:546.19

DOLMANOVA, I. F., BOI'SHOVA, T. A., SHEKHOVTSOVA, T. N., and PESHKOVA, V. M.,  
Moscow State University imeni M. V. Lomonosov

"Kinetic Method for Determining Chromium Traces in Gallium Arsenide"

Moscow, Zhurnal Analiticheskoy Khimii, Vol 27, Vyp 9, 1972, pp 1848-1851

Abstract: Column extraction and ion exchange chromatography are used to separate traces of Cr from the major elements GaAsO<sub>3</sub>, and a Cu-Co-Ni mixture.

The sample is dissolved in nitric acid, oxidizing the arsenic to arsenic acid. The arsenic acid is carried through the column while the Cr(III) is adsorbed. The Cr (III) is subsequently removed from the column with 3 N HCl. Interfering ions of Cu (II), Co(II), and Ni(II)--were removed from the acid solution by extraction with dithizone in CCl<sub>4</sub> for 20-30 min on a mechanical shaker. Concentrations of Cr(III)--as the dithizonate in the aqueous phase--were determined from the oxidation by H<sub>2</sub>O<sub>2</sub> of o-dimethoxybenzidine if the concentrations were greater than 10<sup>-3</sup> micrograms/ml and of o-dimethoxybenzidine - γ-picoline for concentrations of 10<sup>-3</sup> to 10<sup>-5</sup>. The reaction was followed on a spectrophotometrically at λ<sub>max</sub> = 350 nm.

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Extraction and Refining

USSR

UDC 543.432

ALINARIN, I. P., BOL'SHOVA, T. A., and YERSHOVA, N. I., Chair of Analytical Chemistry

"Gallium Extraction With Tri-n-butyl Phosphate From Ammonium Thiocyanate Solutions"

Moscow, Vestnik Moskovskogo Universiteta, Seriya II -- Khimiya, Vol 11, No 5, Sep-Oct 70, pp 568-572

Abstract: The article describes results of a study of the conditions and mechanism of gallium extraction with tri-n-butyl phosphate from ammonium thiocyanate solutions. Microgram quantities of gallium were determined photometrically with 1-(2)-pyridylazoresorcinol as the reagent, and milligram quantities were determined complexometrically. The thiocyanate ion and chloride ion concentrations were determined argentometrically, and the concentration of chlorides in the presence of thiocyanate ions was determined by a method based on the oxidation of thiocyanate ions with hydrogen peroxide in an alkaline medium. The extraction of gallium was studied as a function

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USSR

ALIMARIN, I. P., et al., Vestnik Moskovskogo Universiteta, Seriya II --  
Khimiya, Vol 11, No 5, Sep-Oct 70, pp 568-572

of thiocyanate ion concentration, aqueous phase acidity, and metal concentration. Chemical analysis data, as well as results obtained by the equilibrium shift method, indicate that in the organic phase the gallium-to-thiocyanate ion ratio is 1 : 3.

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USSR

UDC: 51:801

BOL'SHOY, A. A.

"The LR(R)-Property and Equivalent Transformations of Grammars"

Sb. rabot Vychisl. tsentra Mosk. un-ta (Collected Works of the Computing Center of Moscow University), 1971, vyp. 17, pp 9-12 (from RZh-Kiber-netika, No 4, Apr 72, Abstract No 4V609)

Translation: The author considers transformations of an LR(k) grammar (RZhMat, 1967, 1V390) to an equivalent grammar, where the transformations conserve the LR(k) property, and where this property is not retained as well. For every LR(k) grammar, a method is indicated for constructing an equivalent LR(k) with productions of the form  $S \rightarrow \lambda$ ,  $A \rightarrow BC$ ,  $A \rightarrow a$ , where S is the initial symbol, A, B and C are nonterminal, and a is a terminal symbol, and  $\lambda$  is the empty word. A. Maslov.

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Organ and Tissue Transplantation

USSR

UDC: 616.12-089.843-089.168

FAL'KOVSKIY, G. E., KAZAKOV, E. N., YARLYKOVA, Ye. I., ASTRAKHANTSEVA, G. I.,  
ALEKSEYEVA, L. A., KOBKOVA, I. D., SOKOLOV, M. V., GALANKINA, I. Ye., BOL'SHUKHINA,  
L. A., and GUDKOVA, R. G., Institute of Cardiovascular Surgery imeni A. N. Batul'ev,  
Academy of Medical Sciences USSR, Moscow

"The fate of an Heterotopic Heart Allotransplant"

Moscow, Eksperimental'naya Khirurgiya i Anesteziologiya, No 6, Nov/Dec 70, pp 3-12

Abstract: Donor hearts transplanted to the iliac arteries of recipient dogs survived up to 16 days. The causes of cessation of transplant function during the first 1/3 hours were surgical complications (death of the recipient from the anesthetic, hemorrhages from the sutures, thrombosis). In the absence of such complications, the transplants continued to function 3 to 12 days average, (4.75 days) when immunodepressants were not used, and 3 to 8 days (average, 6.16 days) when they were. Cardiac arrest was preceded by arrhythmias, a decrease in voltage of the ventricular complex, and increase in lymphocytes in the peripheral blood following leukopenia. Immunomorphological changes in the recipient's lymphatic system preceded the morphological signs of rejection in the transplant (pronounced lymphoid-histiocyte infiltration, changes in the arteris, and metabolic disturbances in the myocardium).

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USSR

*B*  
TABITADZE, A. G., POLOCHIN, Yu. V., and MYKAIKOV, L. A. *Abstracts of the*  
Physico-Chemical Institute Acad. L. Ya. Kurnakov, Moscow, USSR, 1977, 1978  
Chemistry

"Adsorption of vapors of noble metals on a tungsten filament."

Moscow, Zhurnal fizicheskoy khimii, Vol. 51, No. 1, 1977, p. 100.

Abstract: Au, Pt, and Ag were adsorbed on a tungsten filament in the presence of the vapor phase of benzene, ethyl alcohol, and water. The adsorption was carried out at 820° in an evacuated glass vessel which also contained a tungsten filament. The electric conductivity of the filament increased considerably after the adsorption of the noble metals, but dropped after even a small amount of benzene was desorbed. The decrease in conductivity was observed when the filament was heated to 820° and was not so desorption of the noble metals. The results of the experiments carried out are discussed in experiments in which it was shown that the noble metals were adsorbed on the surface of the tungsten filament and not on this surface.

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USSR

UDC: 621.396.67:624.97

BOL'SHINOV, F. F., VANYUSHIN, V. N., DUBROVIN, V. F., DMITRIYEVSKIY, N. M.,  
POLINOV, Yu. S., REZNIK, A. P.

"Antenna-Mast Support"

USSR Author's Certificate No 266868, filed 10 Jun 68, published 3 Jul 70  
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1B102 P)

Translation: The proposed support consists of interconnected elements, a support framework mounted on a truck platform, an antenna with attached feeder channel, and mechanisms for folding and unfolding the support. To simplify folding and unfolding of the support, the feeder channel is made in the form of individual sections which are securely fastened to the elements of the mast and hinged together.

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USSR

UDC: 539.3/.5

LEONT'YEV, A. V., STROILOV, Yu. S., LAKIN, Ye. Ye., ~~SOLOVYOV, D. N.~~

"Singularities of Plastic Deformation of Solidified Gases"

Sb. nauchn. tr. Fiz.-tekhn. in-t nizm. temperatur AN USSR (Collected Scientific Works of the Physicotechnical Institute of Low Temperatures, Academy of Sciences of the USSR), 1969, vyp. 5, pp 242-254 (from RZh-Fizika, No 9, Sep 70, Abstract No 9Ye591)

Translation: Plastic deformation of crystalline methane and argon was studied by the method of stress relaxation and by plotting tensile stress-strain diagrams. The temperature regions were determined in which the deformation of methane and argon is dependent on mechanisms with sharply differing activation energies. The results are compared with data for other solidified gases. It was found that the greater the energy contribution from translational and libration zero-point vibrations, the lower the temperatures will be at which transition takes place from the Peierls mechanism, which generally controls low-temperature deformation of solidifying gases, to more energetic mechanisms. In accordance with these transition points, a number of molecular crystals were constructed which are in reasonable

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USSR

LEONT'YEVA, A. V., et al, Sb. nauchn. tr. Fiz.-tekhn. in-t nizk. temperatur  
AN USSR, 1969, vyp. 5, pp 242-254

agreement with the De Bur [sic] series with respect to the quantum number  $\lambda$ ,  
which is proportional to the contribution which the energy of zero-point vibrations makes toward the bonding energy. Authors' abstract.

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1/2 054 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--INITIAL STAGE IN CAVITATION DAMAGE TO LEAD -U-

AUTHOR--(03)-KROT, YU.YE., BOLSHUTKIN, D.N., PROKHVATILOV, A.I.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA METALLOV I METALLOVEDENIE, MAR. 1970, 29, (3), 651-652

DATE PUBLISHED----MAR70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--LEAD, ULTRASONIC IRRADIATION, CRYSTALLIZATION, WATER, LIQUID  
OXYGEN, TEST METHOD, CAVITATION, SURFACE PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0205

STEP NO--UR/0126/70/029/003/0651/0652

CIRC ACCESSION NO--AP0129461

UNCLASSIFIED

2/2 054

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0129461

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INITIAL STAGES IN THE CAVITATIONAL EROSION OF PB WERE STUDIED BY A METALLOGRAPHIC METHOD, WITH SPECIAL REF. TO THE TYPE OF CHANGE MOST EVIDENT ON THE SURFACE OF THE METAL (THE CAVITATION WAS INDUCED BY MEANS OF ULTRASOUND, BOTH WATER AND LIQUID O BEING USED AS MEDIA). THERE APPEARED TO BE A DIFFERENT MECHANISM OF CAVITATION IN LIQUID O AS COMPARED WITH WATER IN THE INITIAL STAGES, THE DAMAGE OCCURRING WITHIN THE GRAIN RATHER THAN AT GRAIN BOUNDARIES. THIS DIFFERENCE WAS ATTRIBUTED TO RECRYSTALLIZATION PROCESSES WHICH DIFFERED SUBSTANTIALLY IN THE TWO CASES FOR REASONS OF TEMP.

UNCLASSIFIED

USSR

UDC 537.311.33

BOLTAKS, B.I., SAVIN, E.P.

"Effect Of Neutron Irradiation On The Electrical Properties Of Indium Arsenide"

V sb. Radiatsion. fiz. nemet. kristallov (Radiation Physics Of Nonmetal Crystals--  
Collection Of Works), Minsk, Nauka i tekhn., 1970, pp 116-123 (from  
RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1B44)

Translation: It is shown that during irradiation of n-type InAs, the concentration of electrons is increased but irradiation of p-type specimens leads to a decrease of the concentration of holes, and with a certain dose of neutron (depending on the initial concentration of holes in the specimen) p-type material is converted to n-type. With sufficiently large integrated fluxes, the concentration of electrons does not depend on their magnitude, which attains a limiting value of  $\sim 2 \cdot 10^{18} \text{ cm}^{-3}$  (at room temperature). The electrical characteristics (electrical conductivity and Hall effect) of irradiated specimens were investigated in the temperature range 80--600° K, and annealing of radiation defects was also studied. On the basis of the results obtained, the problem is considered of the nature of the defects originating during irradiation and their effect on the concentration and mobility of current carriers. 5 ill. 6 ref. Summary.

1/1

USSR

UDC 621.315.592

BAKHADYRKHANOV, M. K., ~~BOLTAKS, B. I.~~, KULIKOV, G. S., PEDYASH, E. M., Institute of Semiconductors, Leningrad, Academy of Sciences USSR

"Diffusion, Solubility, and Electrical Properties of Zinc in Silicon"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 873-878

Abstract: The diffusion and solubility of zinc in silicon and its effect on the electrical properties of silicon were studied. It was established that the diffusion of zinc in silicon has complex dissociative nature, and the diffusion coefficient in the 1,100-1,300°C range varies from  $10^{-7}$  to  $10^{-6}$  cm<sup>2</sup>/sec. The life of zinc at a node and an internode of the silicon lattice calculated from the rise in concentration level with annealing time at 1,200°C is  $10^4$  and  $10^{-3}$  sec, respectively. The solubility is of a retrograde nature with a peak at  $1.5 \cdot 10^{-6}$  cm<sup>-3</sup> at 1,270°C. Zinc introduces three acceptor levels in the forbidden zone of silicon. During the process of decay of the

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BAKHADYRKHANOV, M. K., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 873-878

zinc-silicon solid solution, two donor levels --  $0.1 \pm 0.03$  and  $0.4 \pm 0.03$  eV -- obviously connected with the interstitial zinc appear. The authors calculate the chemical potential level of silicon alloyed with zinc and demonstrate the possibility of obtaining the compensated material in a broad range of current carrier concentrations.

The conditions of obtaining silicon with a given specific resistance are calculated inasmuch as zinc in silicon is an acceptor and inasmuch as a compensated material can be obtained by introducing zinc into electronic silicon. The experimental data from the electrical measurements (carrier concentration, carrier mobility, specific resistance) before and after alloying the silicon with zinc and also for the control samples annealed without zinc are compared with the calculated data. It is noted that the concentration of electrically active zinc atoms is  $\sim 3$  orders less

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USSR

BAKHADYRKHANOV, M. K., et al. Fizika i Tekhnika Poluprovodnikov,  
Vol 4, No 5, 1970, pp 873-878

than the solubility determined from radioactive measurements. A significant part of the zinc atoms apparently settle in the dislocations that occur, for example, for cobalt in silicon or they enter into the composition of electrically inactive complexes. The experimental data compare well with the calculated data except for converged samples, and it is assumed that these divergences are the result of incorrect calculations.

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1/2 031 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--DIFFUSION, SOLUBILITY, AND ELECTRICAL PROPERTIES OF COBALT IN  
SILICON -U-  
AUTHOR-(03)-BAKHADRYKHANOV, M.K., BOLTAKS, B.I., KULIKOV, G.S.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TVERD. TELA 1970, 12(1) 181-9  
DATE PUBLISHED-----70  
B  
SUBJECT APFAS--MATERIALS, PHYSICS  
TOPIC TAGS--COBALT, SILICON, SOLUBILITY, PHYSICAL DIFFUSION, POTENTIAL  
DIFFERENCE, METAL COATING, ELECTRIC PROPERTY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REF/FRAME--1980/0242 STEP NO--UR/0181/70/012/001/0181/0187  
CIRC ACCESSION NO--AP0048521  
UNCLASSIFIED

2/2 031

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0048521

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A COMPLEX INVESTIGATION WAS CARRIED OUT OF DIFFUSION, SOLY., AND THE EFFECT OF CO ON THE ELEC. PROPERTIES OF SI. DIFFUSION HAS A COMPLEX DISSOCIATIVE CHARACTER. THE DIFFUSION COEFF. OF CO IN SI IS OF THE ORDER OF  $10 \text{ PRIME}^{-5} \text{ MINUS} 10 \text{ PRIME}^{-4} \text{ CM PRIME}^2 \text{ SEC}$  AT  $1000-1300^\circ\text{C}$ . SOLY. HAS A RETROGRADE CHARACTER WITH A MAX. OF 2 TIMES  $10 \text{ PRIME}^{16} \text{ ATOMS-CM PRIME}^3$  AT  $1240^\circ\text{C}$ . CO IMPURITIES ARE PRESENT IN SI IN THE FORM OF ACCEPTORS AND CREATE 5 LEVELS IN THE FORBIDDEN BAND:  $E_{\text{SUBV}} \text{ MINUS } E_{\text{SUBA1}} \text{ EQUALS } 0.10 \text{ PLUS OR MINUS } 0.02 \text{ EV}$ ;  $E_{\text{SUBV}} \text{ MINUS } E_{\text{SUBA2}} \text{ EQUALS } 0.30 \text{ PLUS OR MINUS } 0.03 \text{ EV}$ ;  $E_{\text{SUBC}} \text{ MINUS } E_{\text{SUBA3}} \text{ EQUALS } 0.22 \text{ PLUS OR MINUS } 0.03 \text{ EV}$ ;  $E_{\text{SUBV}} \text{ MINUS } E_{\text{SUBA4}} \text{ EQUALS } 0.37 \text{ PLUS OR MINUS } 0.2 \text{ EV}$ ; AND  $E_{\text{SUBV}} \text{ MINUS } E_{\text{SUBA5}} \text{ EQUALS } 0.52 \text{ PLUS OR MINUS } 0.02 \text{ EV}$ . CALC. WAS MADE OF THE LEVEL OF CHEM. POTENTIAL OF SI DOPED WITH CO, AND THE POSSIBILITY IS SHOWN OF OBTAINING COMPENSATED MATERIAL IN A BROAD INTERVAL OF CONCNS. OF CURRENT CARRIERS.

UNCLASSIFIED

1/2 051 UNCLASSIFIED PROCESSING DATE--32OCT70  
TITLE--EFFECT OF NEUTRON IRRADIATION ON THE DIFFUSION OF ZINC IN INDIUM  
ARSENIDE -U-  
AUTHOR-(02)-BOLIAKS, B.I., SAVIN, E.P. **B**  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(3), 567-8  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
  
TOPIC TAGS--NEUTRON IRRADIATION, ZINC, RADIATION EFFECT, SINGLE CRYSTAL,  
ELECTRON MOBILITY, ELECTROMOTIVE FORCE, INDIUM ARSENIDE, ELECTRIC  
CONDUCTIVITY, METAL DIFFUSION  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--198P/0819 STEP NO--UR/0444/70/004/003/0557/0558  
CIRC ACCESSION NO--AP0105724  
UNCLASSIFIED

2/2 051

UNCLASSIFIED

PROCESSING DATE--02/07/77

CIRC ACCESSION NO--AP0105724

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SINGLE CRYSTAL V-TYPE INAS SAMPLES WITH 5 TIMES 10 PRIME16 ELECTONS-CM PRIME3 AND A MOBILITY OF 25,000 CM PRIME2-V SEC WERE IRRADIATED WITH 5 TIMES 10 PRIME16 FAST NEUTRONS-CM PRIME2 AT 150DEGREES IN A REACTOR BEAM HOLE. AFTER IRRADN., THE ELECTRON CONC. WAS 2 TIMES 10 PRIME17 CM PRIME3. ZN WAS DIFFUSED INTO THE SAMPLES IN AR FILLED SIO SUB2 TUBES AT 800DEGREES; THE CONCENTRATIONAL ZN DISTRIBUTION WAS DETD. BY MEASURING THE ELEC. COND. OF THE DIFFUSION LAYER WITH SUBSEQUENT REMOVAL OF THIN LAYERS AND BY THE SIMULTANEOUS DETN. OF THE COND. TYPE THROUGH THE THERMAL EMF. SIGN. AFTER IRRADN., THE DEPTH OF THE P-N JUNCTION WAS 60 MU LESS THAN BEFORE, IMPLYING A DECREASED DIFFUSION COEFF. THE EFFECT IS EXPLAINED BY ASSUMING A DISSOCIATIVE DIFFUSION MECHANISM, WHERE THE ATOMS ARE MOVING THROUGH INTERSTICES, WITH SUBSEQUENT CAPTURE BY VACANCIES.

UNCLASSIFIED

1/3 030 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--EFFECT OF THERMAL DEFECTS ON THE LIFETIME OF CURRENT CARRIERS IN  
GERMANIUM -U-  
AUTHOR--(02)-BOLTAKS, B.I., KONOVA, L.F. **B**  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TEKH. PCLUPROV. 1970, 4(4), 754-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--GERMANIUM SEMICONDUCTOR, THERMAL EFFECT, CRYSTAL DEFECT,  
CARRIER DENSITY, ELECTRON SPECTRUM, TEMPERATURE DEPENDENCE,  
PHOTOMAGNETIC EFFECT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY RELL/FRAME--3004/0654 STEP NO--UR/0449/70/004/004/0754/0759  
CIRC ACCESSION NO--AP0131444

2/3 030

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0131444

ABSTRACT/EXTRACT--(U) CP-0- ABSTRACT. THE EFFECT OF THERMAL DEFECTS OBTAINED IN N-GE (N EQUALS 3.5 TIMES 10 PRIME13-CM PRIME3, TAU EQUALS 250 MINUS 300 MU SEC) ON THE LIFETIME OF MAJORITY AND MINORITY CARRIERS AND ON THE ENERGY SPECTRUM OF ELECTRONS WAS STUDIED. THERMAL DEFECTS WERE GENERATED DURING TEMPERING AT 673-773DEGREESK WITH A RATE, V EQUALS 1000DEGREES-SEC AND AT 773-1073DEGREESK AT V EQUALS 300DEGREES-SEC. THE THERMAL TREATMENT WAS CARRIED OUT IN WET O<sub>2</sub> ACTING AS A GETTER FOR CO IMPURITY ATOMS. PRIOR TO THE MEASUREMENT, THE SAMPLES WERE POLISHED AND ETCHED IN BOILING 30PERCENT H<sub>2</sub>SO<sub>4</sub> O<sub>2</sub>SO<sub>2</sub>. LIFETIMES WERE CALCD. FROM EXPTL. DATA ON THE STEADY STATE PHOTOMAGNETIC EFFECT ON PHOTOCON., AND IN HALL COEFF. IN A WIDE RANGE OF TEMPS. WITH GE SAMPLES SUBJECTED TO THERMAL TREATMENT. THE DEPENDENCE OF TAU ON THE TEMPERING TEMP., T SUBT WAS DETC. AS TAU SIMILAR EXP (DELTA E SUBO-K T SUBT) WITH DELTA E SUBO EQUALS 1 PLUS OR MINUS 0.1 EV, WHEREBY THE COND. REMAINED CONST. THE VARIATION OF TAU IS ASCRIBED TO GENERATION OF RECOMBINATION CENTERS WITH A CONCN. N, WHEREBY TAU IS SIMILAR TO 1 OVER N. N INCREASES WITH THE RATE OF TEMP. RISE DURING TEMPERING. DURING HEAT TREATMENT OF N SAMPLES AT 823-973DEGREESK, THE INCREASE OF TAU WITH T SUBT IS ACCOMPANIED BY A DECREASE OF COND. DURING TREATMENT AT 973-1073DEGREESK, THE SAMPLES BECOME P TYPE AND TAU DECREASES WITH INCREASING T SUBT, WHEREBY THEIR COND. DIMINISHES. ON SLICING TEMPERED SAMPLES, IT IS REVEALED THAT AT 673-773DEGREESK THE THERMAL DEFECTS ARE UNIFORMLY DISTRIBUTED, WHILE THOSE GENERATED AT 823-1073DEGREESK HAVE A HIGHER CONCN. IN THE SURFACE LAYERS.

3/3 030

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0131444

ABSTRACT/EXTRACT--THE TEMP. DEPENDENCE OF MINORITY CARRIER LIFETIME,  $\tau_{SUB1}$ , AT 100-300DEGREEK IS SIGNIFICANTLY AFFECTED BY T SUBT. THE ACTIVATION ENERGIES IN THE DIFFERENT TEMP. RANGES ARE ATTRIBUTED TO THE DIFFERENT ENERGIES OF RECOMBINATION CENTERS. THE RATIO  $\tau_{SUB2}$  OVER  $\tau_{SUB1}$  ( $\tau_{SUB2}$  IS THE MAJORITY CARRIER LIFETIME) IS CLOSE TO 1 AT ROOM TEMP., BUT GROWS WITH DECREASING TEMP., REACHING SIMILAR TO 100 AT 100DEGREEK FOR SOME SAMPLES. FOR N SAMPLES,  $\tau_{SUB1}$  GROWS WITH T SUBT ON ACCOUNT OF THE INCREASED NO. OF TRAPS. ABOVE 773DEGREEK, THE R SUBH (1-T) RELATION SHIFT TO HIGHER R SUBH WITH INCREASING TEMP., WHEREBY THE N SAMPLES ARE COMPENSATED. A SHALLOW DONOR LEVEL IS REVEALED IN N SAMPLES:  $E_{SUBC} - E_{SUB3}$  EQUALS 0.05 EV. TWO ACCEPTOR LEVELS,  $E_{SUBV} + E_{SUB4}$  EQUALS 0.15 EV AND  $E_{SUBV} + E_{SUB5}$  EQUALS 0.03 EV, ARE EVALUATED FROM R SUBH MINUS 1-T RELATIONS. THE UNUSUAL TEMP. DEPENDENCE OF  $\tau_{SUB1}$  OF P SAMPLES WITH A MAX. AND A PLATEAU IS EXPLAINED BY A MODEL IN WHICH THE RECOMBINATION CENTERS ARE VACANCIES WITH ZERO, 1, OR 2 NEG. CHARGES. THE INCREASE NO.  $\tau_{SUB1}$  OF SAMPLES HEATED AT 823-973DEGREEK IS ASCRIBED TO GENERATION OF DONOR LEVELS INTRODUCED BY GE INTERSTITIALS WITH AN ACTIVATION ENERGY OF 0.05 EV. FIVE ACCEPTOR AND 1 DONOR LEVELS IN ALL CAN BE OBSD., DEPENDING ON T SUBT.

FACILITY: INST. POLUPROV., LENINGRAD, USSR.

UNCLASSIFIED

1/3 024 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--DIFFUSION, SOLUBILITY, AND ELECTRICAL PROPERTIES OF ZINC IN SILICON  
-U-  
AUTHOR--(04)-BAKHADYRKHANOV, M.K., BOLTAKS, B.I., KULIKOV, G.S., PEDYASH,  
E.M.  
COUNTRY OF INFO--USSR B  
SOURCE--LENINGRAD, FIZIKA I TEKHNIKA POLUPROVOODNIKOV, VOL 4, NO 5, 1970,  
PP 873-878  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--METAL DIFFUSION, SOLUBILITY, ZINC, SILICON, FORBIDDEN ZONE,  
SOLID SOLUTION, COBALT, ELECTRIC PROPERTY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3007/1261

STEP NO--UR/0449/70/004/005/0873/0378

CIRC ACCESSION NO--AP0136669

UNCLASSIFIED

2/3 024

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136669

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DIFFUSION AND SOLUBILITY OF ZINC IN SILICON AND ITS EFFECT ON THE ELECTRICAL PROPERTIES OF SILICON WERE STUDIED. IT WAS ESTABLISHED THAT THE DIFFUSION OF ZINC IN SILICON HAS COMPLEX DISSOCIATIVE NATURE, AND THE DIFFUSION COEFFICIENT IN THE 1,100-1,300DEGREESC RANGE VARIES FROM 10 PRIME NEGATIVE7 TO 10 PRIME NEGATIVE6 CM PRIME2-SEC. THE LIFE OF ZINC AT A NODE AND AN INTERNODE OF THE SILICON LATTICE CALCULATED FROM THE RISE IN CONCENTRATION LEVEL WITH ANNEALING TIME AT 1,200DEGREESC IS 10 PRIME4 AND 10 PRIME NEGATIVE3 SEC, RESPECTIVELY. THE SOLUBILITY IS OF A RETROGRADE NATURE WITH A PEAK AT 1.5.10 PRIME NEGATIVE6 CM PRIME NEGATIVE3 AT 1,270DEGREESC. ZINC INTRODUCES THREE ACCEPTOR LEVELS IN THE FORBIDDEN ZONE OF SILICON. DURING THE PROCESS OF DECAY OF THE ZINC SILICON SOLID SOLUTION, TWO DONOR LEVELS, 0.1 PLUS OR MINUS 0.03 AND 0.4 PLUS OR MINUS 0.03 EV, OBVIOUSLY CONNECTED WITH THE INTERNODAL ZINC APPEAR. THE AUTHORS CALCULATE THE CHEMICAL POTENTIAL LEVEL OF SILICON ALLOYED WITH ZINC AND DEMONSTRATE THE POSSIBILITY OF OBTAINING THE COMPENSATED MATERIAL IN A BROAD RANGE OF CURRENT CARRIER CONCENTRATIONS. THE CONDITIONS OF OBTAINING SILICON WITH A GIVEN SPECIFIC RESISTANCE ARE CALCULATED INASMUCH AS ZINC IN SILICON IS AN ACCEPTOR AND INASMUCH AS A COMPENSATED MATERIAL CAN BE OBTAINED BY INTRODUCING ZINC INTO ELECTRONIC SILICON. THE EXPERIMENTAL DATA FROM THE ELECTRICAL MEASUREMENTS (CARRIER CONCENTRATION, CARRIER MOBILITY, SPECIFIC RESISTANCE) BEFORE AND AFTER ALLOYING THE SILICON WITH ZINC AND ALSO FOR THE CONTROL SAMPLES ANNEALED WITHOUT ZINC ARE COMPARED WITH THE CALCULATED DATA.

UNCLASSIFIED

3/3 024

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136669

ABSTRACT/EXTRACT--IT IS NOTED THAT THE CONCENTRATION OF ELECTRICALLY ACTIVE ZINC ATOMS IS SIMILAR TO 3 ORDERS LESS THAN THE SOLUBILITY DETERMINED FROM RADIOACTIVE MEASUREMENTS. A SIGNIFICANT PART OF THE ZINC ATOMS APPARENTLY SETTLE IN THE DISLOCATIONS THAT OCCUR, FOR EXAMPLE, FOR COBALT IN SILICON FOR THEY ENTER INTO THE COMPOSITION OF ELECTRICALLY INACTIVE COMPLEXES. THE EXPERIMENTAL DATA COMPARE WELL WITH THE CALCULATED DATA EXCEPT FOR CONVERGED SAMPLES, AND IT IS ASSUMED THAT THESE DIVERGENCES ARE THE RESULT OF INCORRECT CALCULATIONS.

FACILITY: INSTITUTE OF SEMICONDUCTORS, LENINGRAD, ACADEMY OF SCIENCES USSR.

UNCLASSIFIED

1/2 015 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--STUDY OF COMPOUNDS OF TIN WITH GROUP IV ELEMENTS BY THE NUCLEAR  
GAMMA RESONANCE METHOD -U-  
AUTHOR-(04)-PEREPECH, K.V., SEREGIN, P.P., SHIPATOV, V.T., BOLTAKS, B.I.  
COUNTRY OF INFO--USSR  
SOURCE--IZVEST. AKAD. NAUK SSSR, NEORG. MATERIALY, APR. 1970, 6, (4),  
818-819  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--GAMMA RADIATION, TIN COMPOUND, CHEMICAL BONDING, SPECTROSCOPIC  
ANALYSIS, SELENIDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3003/1448 STEP NO--UR/0363/70/006/004/0818/0819  
CIRC ACCESSION NO--AP0130381  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0130381

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE NUCLEAR GAMMA RESONANCE SPECTRA OF A NUMBER OF COMPOUNDS OF SN WITH GROUP IV ELEMENTS (SNSE, SNTE, ETC.) WERE STUDIED AND INTERPRETED IN TERMS OF THE CHEMICAL SHIFT AND QUADRUPOLE SPLITTING OF THE CORRESPONDING MATERIALS. THUS IN THE CASE OF THE DICHALCOGENIDES THE CHEMICAL SHIFT DIMINISHED WITH INCREASING IONICITY OF THE CHEMICAL BOND, AS PREDICTED BY THEORY. NO TRACE OF THE COMPOUND SN SUB2 SE SUB3 WAS FOUND, ONLY A SUPERPOSITION OF THE SPECTRA OF SNSE AND SNSE SUB2.

UNCLASSIFIED

BOLTENKOV, Ye. M.

medicine

SOME METHODOLOGICAL ISSUES PERTAINING TO THE STUDY OF ORGANIZATION OF LIFE

SO: JPRS 54435  
9 NOV 71:

UDC: 616-052.001.11

(Medicine) *see*  
Article by G.I. Tatarskiy and Ye.M. Bolshakov: Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, 1977, No 9, pp 35-41.

The cardinal general biological and philosophical problems of the various sciences are closely linked and intertwined with the theoretical and methodological aspects of medicine. Success of the latter relies on disclosure, on the depth of understanding, and practical conquest of the mechanisms of vital phenomena.

Every new idea added to our knowledge about the basic aspects of life is the route along which additional knowledge can be gained as to the causes and mechanisms of disease, new skill can be acquired to treat and prevent them. Definition of information about the essence of life could stimulate the search for and awareness of a heretofore unknown class of possible disturbances in vital activity, methods of investigating them, means of preventing and removing them.

The influence of conceptions on the essence of life on medicine proceeded in several directions. On the one hand, through dissemination and refraction in it of the most general and basic positions on the nature of life, on the other hand, in the course of penetration of biological concepts into medicine, when substantiating the theory and practice of medicine with such extremely important general biological positions as the principles of adaptation of the organism to its environment, the principle of evolution of living matter, its organization, etc.

Both main aspects of interaction between concepts on the essence of life are closely interrelated. The methodological principles on the basis of which we evolve general concepts on the nature of life are based not only on philosophical positions but also they are a generalization of the data in biological sciences related to the internal dialectical development of biological knowledge as a whole.

By virtue of this correlation, general biological principles consolidated in their methodological aspect become, to some extent, the methodological principles of theoretical pathology.

USSR

UDC 577.1:615.7/9

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ZALESOV, V. S., FRIDMAN, A. L., IVSHINA, T. N., IVSHIN, V. P., TARTAKOVSKIY, V. A., FLAKSINA, A. N., and BOLTIK, T. V.

"Synthesis and Study of the Physiological Activity of Organomercury Nitro Compounds. I. Analysis of the Molecular Complexes of bis-(Trinitromethyl)-mercury"

Izv. Yestestvennonauchn. in-ta pri Permsk. un-te (News of the Institute of Natural Sciences, Perm University), 1970, 14, No 10, pp 159-168 (from RZh-Biologicheskaya Khimiya, No 9, May 71, Abstract No 9 F1876 from the résumé)

Translation: Synthesized molecular complexes of bis-(trinitromethyl)-mercury with diethyl-N-nitrosamine, diethylsulfone, dimethylsulfoxide, tetrahydrofuran, dioxane, and hexamethylenetetramine were found to be lacking in neurotropic, anticonvulsive, and antitremor action in mice and rats but possessing weak antimicrobial activity (E. coli, staphylococci) and high toxicity for mice after intraperitoneal injection (LD<sub>50</sub> 14.8 to 24.5 mg/kg or peroral administration (55 to 124 mg/kg) and for rats after peroral administration (51.4 to 305 mg/kg). Two preparations at toxic doses manifested weak analgesic action.

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1/2 035 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--BOLT AMPERE CHARACTERISTICS OF AMORPHOUS LAYERS BASED ON A PRIMEII  
B PIMEIV-C PRIMEV TERNARY SYSTEMS -U-  
AUTHOR--(05)-BARYSHEV, V.G., BOLTIYETS, N.A., BORSCHESKIY, A.S.,  
GORYUNOVA, N.A., ORESHKIN, P.T.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 372-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, MATERIALS  
TOPIC TAGS--AMORPHOUS SEMICONDUCTOR, VOLT AMPERE CHARACTERISTIC, THIN FILM  
SEMICONDUCTOR, ARSENIDE, GERMANIUM COMPOUND, CADMIUM COMPOUND,  
PHOSPHIDE, PULSE SIGNAL  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REFL/FRAME--1988/0088 STEP NO--UR/0449/70/004/002/0372/0375  
CIRC ACCESSION NO--AP0105174  
UNCLASSIFIED

2/2 035 UNCLASSIFIED PROCESSING DATE--23OCT70  
CIRC ACCESSION NO--AP0105174  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AMORPHOUS LAYERS (2-6 MU THICK)  
WERE PREPD. BY VACUUM SPUTTERING OF CDGEAS SUB2, ZNGEAS SUB2, AND CDGEP  
SUB2 ON GALSS SUBSTRATES AND WERE PROVIDED WITH EVAPD. METAL ELECTRODES  
(SN, PB). THE FILM COMPNS. DID NOT CORRESPOND TO THOSE OF THE INITIAL  
SUBSTANCES; THE CONTENT OF THE LEAST VOLATILE COMPONENT (GE) WAS  
DECREASED. ON THE DYNAMIC CURRENT VOLTAGE CHARACTERISTICS OF THE FILMS,  
SWITCHING FROM THE CUTOFF TO THE OPEN STATE WITH MEMORY WAS FOUND. THE  
CHARACTERISTICS WERE NOT AFFECTED BY CHANGES IN FREQUENCY OF 3 ORDERS OF  
MAGNITUDE. THE THRESHOLD OF NEG. RESISTANCE IN THE FILMS STUDIED WAS  
SIMILAR TO 2 TIMES 10 PRIME4 V-CM. THE CURRENT VOLTAGE CHARACTERISTICS  
STUDIED WITH RECTANGULAR PULSES SHOWED THAT THE MEMORY IS PRESENT FOR  
PULSE DURATION GREATER THAN 4 TIMES 10 PRIME NEGATIVE6 SEC AND THAT THE  
BREAKDOWN VOLTAGE INCREASES WITH DECREASING PULSE DURATION. THE  
SWITCHING FROM THE CUTOFF TO THE OPEN STATE IS DETD. BY AN ACCUMULATED  
CHARGE; I.E., IT DEPENDS ON BREAKDOWN VOLTAGE AS WELL AS ON BREAKDOWN  
CURRENT. FACILITY: FIZ. TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

Acc. Nr: **AT0018318** Abstracting Service:  
CHEMICAL ABST. 5-70

Ref. Code:  
**UR0020**

**B**

103334c Preparation of CdSiAs<sub>2</sub> in the vitreous state. Bol-  
toevs, N. S.; Goryunova, N. A.; Prochukhan, V. D.; Ser-  
ginov, M. (Fiz.-Tekh. Inst. im. Ioffe, Leningrad, USSR).  
Dokl. Akad. Nauk SSSR 1970, 190(3), 619-20 [Phys. Chem]  
(Russ). A vitreous form of CdSiAs<sub>2</sub> is produced by hardening a  
melt contg. stoichiometric amts. of the elements and also CdSiAs<sub>2</sub>  
which is prepd. according to a method described by G. K. Aver-  
kieva, *et al.* (1969). This semiconductor possesses a softening  
temp. around 500°, which significantly exceeds the softening  
temp. of other glasses of this type. C. J. Steinberg

*pc*

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REEL/FRA  
19800020

*18*

USSR

UDC 636.22/28:576.8.057.29

~~BOITUSHKIN, A. N.~~, KOVAL'SKAYA, M. G., LUPANDINA, K. N., and STUFNIKOV, V. D.,  
Leningrad Veterinary Institute; Leningrad Oblast' Veterinary Laboratory

"Fusariotoxicoses of Cattle"

Leningrad, Mikologiya i Fitopatologiya, Vol 5, No 1, 1971, pp 75-76

Abstract: For a number of years, fusariotoxicoses of cattle that developed as a result of consumption of straw, grain, and stubble infected with *Fusarium* fungi have been observed in the USSR. In 1967-69, fusariotoxicosis of cattle occurred at the Experimental Model Farm Kolozhitsy in Volosovsk Rayon, Leningrad Oblast', after the cattle had been driven to pasture on a harvested rye field. The symptoms and pathological-anatomical changes in the diseased cattle were identical with those observed in cattle upon experimental feeding of grain infected with *Fusarium sporotrichiella*. Symptomatic treatment was applied. *F. graminearum* and *F. oxysporum* were isolated from samples of straw stalks, ears, and rye grains collected from the field and used as feed by the cattle. The degree of infection of the feed with these fungi was 40-100%. The cultures of fungi that were isolated were considered toxic on the basis of lethality for *Paramecia caudata* and the effect on the

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USSR

BOLTUSHKIN, A. N., et al., Mikologiya i Fitopatologiya, Vol 5, No 1, 1971,  
pp 75-76

skin of rabbits of ether extracts of the fungi. Similar symptoms were  
shown in 1962 by cattle on the farm in question, but the disease was not  
identified then.

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USSR

UDC: 620.10

BOLTUSHKIN, A. V., Instructor

"Experimental Study of the Behavior of a Spherical Shell Loaded by a Concentrated Tangential Force and a Bending Moment"

Moscow, Izvestiya VUZov: Mashinostroyeniye, No 7, 1973, pp 5-9

Abstract: The paper is written in an attempt to develop a method of calculating plastically deformable systems in accordance with force-displacement diagrams. An experimental study is made of the case of loading a spherical shell by a concentrated complex load consisting of a tangential force and a bending moment. Graphic relations are derived for determining the behavior of the structure with a change in load from zero to limiting values. A comparative analysis is made of the deformed state of the shell when it is loaded by a pure bending moment and when it is loaded by the complex load described above. From the results of the experiments a curve is plotted for a dimensionless force parameter as a function of a geometric parameter. This curve can be used to estimate the carrying capacity of a shell loaded by a tangential force and a bending moment.

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USSR

UDC 615.917:547.234.9'222.2

ABRAMOVA, ZH. I., CHERNYI, Z. KH. and BOLTUSHKINA, L. A., Institute of Labor Hygiene and Occupational Diseases, Leningrad

"Pathogenesis of Granosan Intoxication"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 11, 1972, pp 21-24

Abstract: The effect of granosan was studied by subcutaneous injection of 5 mg/kg twice a week into male white rats weighing 180-240 grams and intra-peritoneal injection into male mice weighing 18-25 grams of 5 mg/kg daily for 20 days. The threshold of electrical stimulation was measured, the behavioral effect of phenamine, apomorphine and reserpine was studied and urinary levels of 5-hydroxyindole acetic acid, epinephrine and norepinephrine were studied. Serotonin levels were measured in brain and stomach tissues. It was observed that changes included increased irritability, lessened effect of phenamine, apomorphine and reserpine action compared to controls, and altered tryptophan, serotonin and catecholamine metabolism, although no change in norepinephrine levels in the brain was found.

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USSR

UDC 539.216.22:546

IL'YUSHENKO, L. F., and BOLTUSHKIN, A. V., Institute of Solid State and Semiconductor Physics, Academy of Sciences BSSR

"Electric Deposition of Films of Binary Alloys of Metals of the Iron Group With Chromium"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No 6, 1970, pp 125-128

Abstract: Since there was no data in the literature on electrolytic magnetic films containing chromium, this study was made to show conditions necessary to produce Fe-Cr, Ni-Cr, and Co-Cr films of various compositions and study the dependence of their magnetic properties on chromium content. It is noted that magnetic alloys based on metals of the iron group doped with chromium have high magnetic permeability and low coercive force. Upon the introduction of chromium into an alloy, its corrosion resistance and specific electrical resistance are increased. Films of these materials can be applied in computer and UHF technology. Graphs are given showing the chromium content in percent and the coercive force of the films as a function of film thickness. With an increase in the film thickness to 2000 Å, there is a considerable rise in the  $I/Z$

USSR

IL'YUSHENKO, L. F., and BOLTUSHKIN, A. V., Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Matematicheskikh Nauk, No. 6, 1970, pp 125-128

coercive force and then a gradual drop to a certain constant value. This behavior is associated with changes in the composition and structure occurring in the film with an increase in its thickness. The change in the saturation induction and coercive force of films with a thickness of 2000 Å as a function of chromium content was measured and showed that an increase in chromium content leads to a drop in saturation induction. The coercive force of Co-Cr-films rises with an increase in concentration, and in Fe-Cr-films there is first a growth in the coercive force with an increase in concentration and then a smooth drop, beginning with 7-8% Cr. This behavior is attributed to a change in the structure of the alloy.

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USSR

BOLTUSHKINA, L. A., ABRAMOVA, Zh. I., PROKHOROV, V. N., and CHERNYI, Z. Kh.

"Ulcerogenic Effect of Chlorophos"

V sb. Nauchn. sessiya, posvyashch. itogam raboty Leningr. NII gigiyeny truda i prof. zabolevaniy za 1968-1969 gg., 1970. Tezisy dokl. (Scientific Session Devoted to the Results of the Work of the Leningrad Scientific Research Institute of Labor Hygiene and Occupational Diseases for 1968-1969, 1970: Summaries of Papers -- Collection of Works), Leningrad, 1970, pp 29-30 (from RZh-Farmakologiya, Khimoterapevticheskiye Sredstva, Toksikologiya, No 4, Apr 71, Abstract No 4.54.709 by M. M. AVKHIMENKO)

Translation: Chlorophos in a dose of 150 mg/kg for 10 days was administered internally to male rats. Findings: change in acidpepsin factor; positive Pauls' index; inhibition of blood cholinesterase activity; insignificant changes in serotonin content of subcortical brain formations and gastric tissues. Under the combined action of chlorophos and ulcerogenic factors (reserpine 5 mg/kg, atophan 500 mg/kg, stress) destructive lesions of the gastric wall were more pronounced. The authors conclude that chlorophos affects the gastrointestinal tract.

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USSR

UDC 681.325.65

BOLTYANSKIY, A. A., PSHENICHNIKOV, Yu. V., SKOBELEV, O. P.

"Multichannel Analog-Digital Converters Based on Test Transient Processes in Measurement Circuits"

Novosibirsk, Konf. po avtomatiz. nauch. issled. na osnove primeneniya EVM, 1972--sbornik (Conference on Automating Computer-Based Scientific Research, 1972--collection of works), 1972, pp 77-83 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 72, abstract No 11B301)

Translation: The paper demonstrates the effectiveness of using methods based on test transient modes in measurement circuits to design multichannel analog-digital converters. The methods are formulated on the basis of the simplest model of pickups and measurement circuits in the form of an aperiodic system; the method of instantaneous values, the constant time method, the method of the first derivative, and the method of integral conversion are considered. The structures of multichannel converters for parametric and oscillator pickups developed on the basis of these methods are described. Two illustrations, bibliography of two titles. L. P.

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- 50 -

1/3 014 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--PHASE COMPOSITION OF MAGNESITE CHROMITE REFRACTORIES WITH GUNITE  
COATINGS AFTER SERVICE IN THE ROOF OF AN OPEN HEARTH FURNACE -U-  
AUTHOR--(05)-PYATIKOP, P.D., PIROGOV, YU.A., BOLTYANSKIY, A.V., GURSKIY,  
G.L., KOBYLKO, V.S.  
COUNTRY OF INFO--USSR  
SOURCE--OGNEUPORY 1970, 35(3), 37-40  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--OPEN HEARTH FURNACE, SPINEL, OXIDE REFRACTORY, PHASE  
COMPOSITION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1996/0875 STEP NO--UR/0131/70/035/003/0037/0040  
CIRC ACCESSION NO--AP0118046  
UNCLASSIFIED

2/3 014

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118046

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR THE COATING OF REFRACTORIES GUNITE POWDER OF COMPN. CR SUB2 O SUB3 31.5-7.7, MGO 33.8-42.8, CAO 0.54-1.6, AL SUB2 O SUB3 4.7-6.5, SIO SUB2 4.2-5.5, AND FE SUB2 O SUB3 8.5-10.5PERCENT WAS USED. ON THE BRICKS WITH GUNITE COATINGS AFTER SERVICE IN THE ROOF OF AN OPEN HEARTH FURNACE 4 STRUCTURAL ZONES WERE FOUND: (1) SLIGHTLY CHANGED ZONE, 100-50 MM THICK, (2) THE TRANSITION ZONE, 30-60 MM, (3) WORKING ZONE, 15-25 MM, AND (4) GUNITE COATING ZONE, 20-5 MM. IN THE DIRECTION FROM (1) TO (4) THE CONTENT OF CAO, FEO, FE SUB2 O SUB3 INCREASES WHILE THAT OF MGO AND CR SUB2 O SUB3 DECREASES. THE MAX. SIO SUB2 CONTENT IS FOUND IN (2). (1) SHOWS THE NONUNIFORM GRANULAR STRUCTURE; IT CONSISTS OF PERICLASE (60-70), CR SPINEL (25-30), AND SILICATES (10-12PERCENT). THE PERICLASE (0.2-2.5) AND CR SPINEL (0.5-3.0 MM) GRAINS ARE CEMENTED WITH A FINE GRANULAR MASS. THE SILICATES ARE REPRESENTED BY MONTICELLITE AND RARELY BY FORSTERITE. THE HOMOGENEOUS DISTRIBUTION OF PORES OF THE CRACK FORMS IS OBSERVABLE. (2) IS ANALOGOUS TO (1) ACCORDING TO THE MINERALOGICAL COMPN. BUT IT DIFFERS FROM (1) IN THE FOLLOWING ASPECTS: (1) IT HAS A MORE UNIFORMLY DISTRIBUTED PERICLASE GRAINS, (B) THE PERICLASE GRAINS ARE LARGER, (C) A CONSIDERABLE HIGHER CONTENT (18PERCENT) OF SILICATES IN WHICH MONTICELLITE PREVALIS, (D) THE PRACTICAL ABSENCE OF FINE CRACKS AND ON THE OTHER HAND THE PRESENCE OF LARGE AMT. OF PORES OF SIZES 0.03-1 MM. (3) IS COMPOSED OF SECONDARY SPINEL, CR SPINEL PERICLASE, AND SILICATES. THE SECONDARY SPINELS FORM THE MAIN COMPONENT (63-70PERCENT) WITH BLACK GRAINS 0.05-0.3 MM.

UNCLASSIFIED

3/3 014

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118046

ABSTRACT/EXTRACT--THE CR SPINEL AND SECONDARY SPINEL GRAINS ARE IN CLOSE CONTACT. THE PERICLASE IN THE FORM OF CORRODED GRAINS IS CLOSELY PERMEATED WITH THE SECONDARY SPINEL INCLUSIONS. SILICATES ARE PRESENT AS MONTICELLITE AND MERWINITE. ZONE (4) CONSISTS OF SECONDARY SPINEL (85-8), CR SPINEL (SIMILAR TO 6), AND SILICATES (6-15PERCENT).  
FACILITY: UKR. NAUCH.-ISSLED. INST. OGNEUPOR., KHARKOV, USSR.

UNCLASSIFIED

USSR

B

PYATIKOP, P. D., PIROGOV, YU. A., BOLTYANSKIY, A. V., GURSKIY, G. L., KOBYLKO, V. S.

"Phase Composition of Magnesite-Chromite Refractories With Gunitite Coatings After Service in the Crown of an Open-Hearth Furnace"

Moscow, Ogneupory, No 3, Mar 70, pp 37-40

Abstract: Guniting the rear walls of open-hearth furnaces at "Zaporozhstal'" plant has increased their life from 180-200 to 500 and more cycles. The rear wall is gunited with a semidry powder mixture at least once per day. The composition of the powder is: 31.5-37.7%  $\text{Cr}_2\text{O}_3$ , 33.8-42.8%  $\text{MgO}$ , 0.5-1.6%  $\text{CaO}$ , 4.7-6.5%  $\text{Al}_2\text{O}_3$ , 4.2-5.5%  $\text{SiO}_2$ , 8.5-10.5%  $\text{Fe}_2\text{O}_3$ , weight loss 1.7-3.0%. The powder contains not over 7% particles over 1 mm, 20-25% particles less than 0.071 mm. The binder and moistener used is an aqueous solution of liquid glass with a density of 1.17-1.20 g/cm<sup>3</sup>. The authors studied the chemical and phase compositions of the magnesite-chromite refractories which had 1/2

USSR

PYATIKOP, P. D., et al., Ogneudory, No 3, Mar 70, pp 37-40

been used in the rear line of the crown of an open-hearth furnace operating with oxygen injection. Photographs showing the general appearance and microstructure of the refractories are presented, as well as a graph of the oxide content of the refractories after usage. The guniting of the working surface of the refractories forms a layer of highly refractory materials, protecting the brick from the effects of dust, preventing deep penetration of silicate melts into the cold zones of the brick, and consequently decreasing the rate of conversion of the brick and the intensity of brick wear during service.

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USSR

UDC: 517.934:517.966

BOLTYANSKIY, V. G., Mathematics Institute imeni V. A. Steklov,  
Academy of Sciences of the USSR

"Optimality Criteria for Discrete Processes"

Minsk, Differentsial'nyye Uravneniya, Vol 8, No 10, Oct 72, pp  
1745-1752

Abstract: Certain theorems are proved which contain necessary conditions of optimality for processes in controlled objects with discrete time. The resultant optimality criteria are analogous to those which can be found in papers by Propoy, Polak, and others. However, the criteria given in this paper are more general. The necessary extremum conditions contained in the author's article in "Differentsial'nyye Uravneniya", Vol 8, No 9, 1972, are taken as the basis for derivation of these optimality criteria.

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USSR

BOLTYANSKIY, V. G. (Steklov Mathematics Institute, USSR Academy of Sciences)

"Discrete Principle of the Maximum (Method of Local Sections)"

Minsk, Differentsial'nyye Uravneniya; November, 1972; pp 1927-35

ABSTRACT: L. S. Pontryagin's principle of the maximum -- the central result of the mathematical theory of the optimal control of continuous processes -- has had a substantial effect also on the theory of the optimal control of discrete processes. There are a number of works in which a discrete principle of the maximum has been established.

In this article the author presents a fairly general version of the discrete principle of the maximum. The result obtained is based -- on the one hand -- on a method of local sections, developed by the author and applied to controllable processes which are continuous, and -- on the other -- on a method of pyramids, recently applied by the author to problems of mathematical programming and the control of discrete processes.

1/1 The article includes 24 equations. There are seven references.

- 2 -

USSR

UDC 624.012.236:725.36

BOLTYANSKIY, Ye. Z., Chief Departmental Specialist, Central Scientific Research Institute of Industrial Grain Planning, LIUBAUSSAS, Ya. H., Chief of the Mechanization Administration, Central Elevator Construction Trust.

"An Experimental Silo Structure With Silos 6 Meters in Diameter"

Moscow, Beton i Zhelezobeton (Concrete and Reinforced Concrete), No 9, September 1971, pp 17-18

Abstract: At the flour combine imeni A. D. Tsypura in Moscow, designed by the Central Scientific Research Institute of Industrial Grain Planning, has been built an experimental silo structure 30,000 tons in capacity, with walls of prefabricated prestressed curvilinear elements. The silo walls were developed on the basis of proposals by the Main Administration of Specialized Elevator Construction of the Ministry of Agricultural Construction, USSR. In calculating the rings with respect to strength and crack resistance, a procedure was adopted which takes into account not only the horizontal stretching forces, as recommended by the standards, but also the conditional bending moment. Information is presented on the technology of production of the elements, the consolidated assembly of the rings, and erection of the silo structure. Working in two shifts, the rate of erection comprised 24 rings per day. 5 figures 2 tables.  
1/1

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USSR

UDC 536.421.4+536.421.1

POIYANOVICH, E. I.

"Effect of Ultrasonic Processing on the Crystallization of InSb and InAs Alloys"

V sb. Kristallizatsiya i faz. prevrashcheniya (Crystallization and Phase Transformations--collection of works) Minsk, "Nauka i tekhn." 1971, pp 106-110 (from RZh-Fizika, No. 9, 1971, Abstract No. 9E386)

Translation: Ultrasonics (US) has been used to obtain the quasi-binary alloys of InSb and InAs. Short descriptions are given of the use of methods for introducing US oscillations into the alloy and measuring their intensity. Tempered crystallization was conducted in the final stage of short-term synthesis in ampoules under the action of US. The processing of the crystallizing melt by US with an intensity of tenths of a watt per cm<sup>2</sup> did not bring about any change in the general character of the InSb and InAs crystallization; the diagram of their state has a kind of degenerate eutectics under unbalanced conditions. Extensive dispersion of the ingot structure was achieved. It was found, as a result of x-ray structural phase analysis, that in ingots obtained with US processing and with small crystallite dimensions, formation of solid solutions of InSb-InAs with annealing proceeds at a faster rate.

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1/2 009 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--AL'FIYA, A NEW HIGH QUALITY LIQUID SYNTHETIC DETERGENT -U-  
AUTHOR--(05)-BELYANOVSKIY, D.M., GETMANSKIY, I.K., LOGIINCVA, N.I.,  
RAYMUSHINA, A.A., KUDYASHOV, A.I.  
COUNTRY OF INFO--USSR  
SOURCE--NEFTEPEKERAB. NEFTEKHIM. (MOSCOW) 1970, (3), 34-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, MATERIALS  
TOPIC TAGS--BIODEGRADABLE DETERGENT, AMIDE, FATTY ACID, PHOSPHATE, UREA,  
BLEACHING AGENT/(U)ALFIYA DETERGENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3C02/0441 STEP NO--UR/0318/70/000/003/0034/0035  
CIRC ACCESSION NC--AP0128011  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128011

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COMPONENTS OF AL'FIYA ARE PRIMARY ALKYL SULFATES 8-13. SEC-ALKYL SULFATES 3-8, SYNTHONAL DT-7 (A PRODUCT OF OXYETHYLATION OF C SUB10 NEGATIVE13 PRIMARY ALCS.) 0-3, SYNTHAMID,5 (MONOETHANGLAMIDES OF SYNTHETIC FATTY ACIDS) 4, NA HEXANETAPHOSPHATE 4, UREA 13, ISO-PROH 1, BLEACHING AGENT 0.15, PERFUME 0.1, AND H SUB2 0 TO 100PERCENT. ALL THE COMPONENTS OF AL'FIYA ARE BIODEGRADABLE. THE WASHING POWER OF A 0.125PERCENT SOLN. OF AL'FIYA IN HARD WATER (15DEGREES) AT 50DEGREES WITH WOOL IS 124-130PERCENT OF THAT OF NA LAURYL SULFATE. AL'FIYA CAN BE USED EFFECTIVELY ALSO FOR SILK AND SYNTHETIC FABRICS. THE STABILITY OF AL'FIYA AGAINST TURBIDITY AT 10DEGREES LASTS GREATER THAN 24 HRS.

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USSR

UDC: 53.07/.08+53.001.5

BOLYATKO, V. V., LIPUNOV, A. D., MASHKOVICH, V. P., SUVOROV, A. P., TSY-PIN, S. G.

"Attenuation of Soft-Spectrum Neutrons in Continuous Shields"

V sb. Vopr. dozimetrii i zashchity ot izluch. (Problems of Dosimetry and Radiation Shielding--collection of works), vyp. 12, Moscow, Atomizdat, 1971, pp 142-146 (from RZh-Fizika, No 4, Apr 72, Abstract No 4A727)

Translation: Soft-spectrum neutron propagation is studied in serpentine ore on an experimental installation -- an intermediate neutron converter. Serpentine ore is used as a filler in concrete, and sometimes independently as a shielding material. The resultant experimental data on the spatial distribution of neutrons of various energies in serpentine ore agree well with the results of calculation done by the ROZ-1 computer program using a specially compiled system of multigroup neutron constants. Only a slight difference is observed in the relative attenuation of the neutron flux density for measurements by resonance indicators. M. L.

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USSR

BOLYCHEVTSEV, A. D., DGBRYDEN', V. A. and RAZUMNYI, V. T.

"The Protection of an Object Servicing a Stable Random Stream"

Pribery i Sistemy Avtomatiki. Resp. Mezhd. Temat. Nauch.-Tekhn. Sb. [Automation Devices and Systems. Republic Interdepartmental Thematic Scientific and Technical Collections], 1973, No 27, pp 62-67 (Translated from Referativnyy Zhurnal Kibernetika, No 10, 1973, Abstract No 10V269)

Translation: The problem of optimization of an algorithm for protection of a single-line queueing system without waiting and with zero servicing time from failures when the input stream is stationary is studied. A condition is produced, establishing the boundary of economic expediency of introduction of protection. An algorithm is constructed which is optimal with respect to the criterion of mean specific expenditures. It is a threshold-type algorithm.

Author's view

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USSR

UDC: 681.2.08

BOLYCHEVTSEV, A. D.

"Optimal Discretization of Level-Quantized Random Signals"

Novosibirsk, Avtometriya, No 1, 1973, pp 32-40

Abstract: This article examines the probability indices of the quality of separate measuring operations and discrete measurements as a whole. The problem of optimal matching of quantized intervals and the discretization of continuous random, normally distributed stationary processes is numerically solved for the case of step-by-step interpolation. The method of solution is based on probability estimates of the measured random process over a period of time, and it is assumed that the process contains no regular or non-random components. Formulas are developed for computing the probability quality index for a broad area surrounding the optimum point and for the error in those formulas. It is shown that the optimal step of uniform discretization may be found from the curve of the measurement process correlation function, and a formula for computing the step is given.

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Reliability Theory

USSA

UDC 621.391.2

BOLYCHEVTSEV, A. D., BOLYCHEVTSEV, E. M., DOBRYDEN', V. A.

"Quantitative Estimates of Overshoot Duration Distribution"

Moscow, Radiotekhnika i elektronika, Vol XVII, No 2, 1972, pp 313-320

Abstract: Simple quantitative approximations were found for the distribution density of the blip duration of a stationary normal random process having continuously twice differentiable realizations for a fixed level. A new quantitative estimate of the distribution density of the overshoot duration of a normal stationary random process for a given level was obtained in the following form:

$$p(t) = \frac{\omega}{2\beta^2\sqrt{1-R^2}} \left\{ \left[ (\beta b)^2 + \frac{k}{2} \right] [1 - \phi(\beta b)] - \frac{\beta b}{\sqrt{\pi}} \exp[-(\beta b)^2] \right\} \exp \left[ -\frac{1-R}{1+R} \frac{u^2}{2\sigma^2} \right],$$

where all the parameters are expressed in terms of the normalized level  $u/\sigma$ , the normalized correlation function  $R(t)$ , its derivatives and  $\omega$ . This estimate differs from the known estimates (of the same degree of strictness) by its

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BOLYCHEVTSEV, A. D., et al., Radiotekhnika i elektronika, Vol XVII, No 2, 1972, pp 313-320

simple, clear form. The estimate is close to the known Rice approximation [V. I. Tikhonov, Vybrosy sluchaynykh protsessov, Nauka Press, 1970], but in contrast to the Rice approximation, it approaches zero at  $t \rightarrow \infty$ . Different descriptions of the conditional probabilities of treatment of the horizontal and vertical windows lead to essentially different quantitative solutions.

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Reliability Theory

USSA

UDC 621.391.2

BOLYCHEVTSEV, A. D., BOLYCHEVTSEV E. M., DOBRYDEN', V. A.

"Quantitative Estimates of Overshoot Duration Distribution"

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where all the parameters are expressed in terms of the normalized level  $u/\sigma$ , the normalized correlation function  $R(t)$ , its derivatives and  $\omega$ . This estimate differs from the known estimates (of the same degree of strictness) by its

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BOLYCHEVTSEV, A. D., et al., Radiotekhnika i elektronika, Vol XVII, No 2, 1972, pp 313-320

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Magnesium

USSR

UDC 541.45,546.46:6 1.984.5

BOLYNETS, F. K., UDALOVA, L. V., ARANOVSKIY, L. I., and ISACHEV, V. P.

"Study of the Kinetics of Compacting of Magnesium Oxide with Added Lithium Fluoride at Various Hot Pressing Temperatures"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, Vol 8, No 2, 1972, pp 285-289

Abstract: The kinetics of compacting of magnesium oxide with added lithium fluoride (1.0 wt.%) by hot pressing in the 80-1100° C temperature interval was studied. The addition of lithium fluoride increases the rate of compacting of magnesium oxide beginning at 650° C.

At 850-1050° C, 3 stages of compacting are observed with slopes of kinetic curves in coordinates  $\log \Delta L/L_0$  from  $\log \tau$  equal to 0.95-1.40; 0.33-0.36; 0.1 respectively to intervals of densities of 0.96-0.97; 0.97-0.995 and over 0.995. Processes of recrystallization of magnesium oxide with the addition of lithium fluoride during hot pressing are studied. The activation energy of the process of recrystallization, equal to 25.7 kcal/mol, is determined from the temperature dependence of the increase in grain size, as 25.7 kcal/mol.

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UDC: 539.142.3

BOLYNSKIY, V. Kh.

"A Nuclear Magnetic Resonance Spectrometer"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329407, Division G, filed 25 Nov 69, published 9 Feb 72, pp 160-161

Translation: This Author's Certificate introduces: 1. A nuclear magnetic resonance spectrometer which contains a device for stabilizing a fixed magnetic field with an external reference specimen, an ampule with receiving circuit, a high-frequency oscillator, a reference voltage source, and a module for scanning and displacement of the field. As a distinguishing feature of the patent, resolution stability is improved by locating another reference specimen with receiving circuit in the gap of the magnet close to the first reference specimen on a line passing through the center of the first specimen parallel to the axis of the ampule. The receiving circuit in the second reference specimen is connected to a spin generator system. Connected to the low-frequency amplifier of the spin generator is a frequency-to-voltage converter to which compensating coils are connected in

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BOLYNSKIY, V. Kh., USSR Author's Certificate No 329407

pairs in two planes which are symmetric relative to the reference specimens, parallel to the surfaces of the pole pieces of the magnet, and tangent by pairs on the sides perpendicular to the axis of the ampule. The coils are wound in layers normal to the lines of force of the fixed magnetic field.

2. A modification of this spectrometer distinguished by the fact that compensation for scanning and displacement of the field is provided at the point of location of the second reference specimen by placing this specimen together with the receiving circuit in a solenoid connected at the output of the module for scanning and displacement of the field.

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USSR

UDC 669.295.472

ANTIPIN, L. N., BOLYNSKIY, V. V., MANSKIY, Ye. G., CHUB, V. Ya., and  
KLIMENYUK, V. A.

"Anode Effect During Electrolysis of Oxyfluorotitanate Melts"

Sb. tr. Vses. n.-i. i proyekt. in-t titana [Collected works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 77-81, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No. 6193 by the authors).

Translation: The causes for the formation of the anode effect during electrolysis of oxyfluorotitanate melts on a carbon-graphite anode are studied. The anode effect arises as a result of formation of non-conducting oxides such as  $\text{COF}_2$  on the surface. The formation of these compounds is accompanied by worsening of wetability and leads to passivation of the anode. Study of the critical D in oxyfluorotitanate melts was performed on an automatic installation recording the volt-ampere functions. Primary influence on the value of critical D is that of the concentration of  $\text{TiO}_2$  in the electrolyte. Experimental results are presented demonstrating the influence of  $\text{TiO}_2$  concentration on critical D. 4 figures; 14 biblio. refs.

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Acc. Nr.: AP0042567

Ref. Code: UR 0293

JPRS 52162

Measurements of Intermediate- and High-Energy Particles

(Abstract: "Measurements of Charged Particles of Intermediate and High Energies," by A. D. Bolyunova, A. D. Verevkin, Yu. I. Gal'perin, L. S. Gorn, L. S. Zhurina, I. D. Ivanov, R. N. Isayeva, I. P. Karpinskiy, E. A. Kovrazhkin, V. V. Temnyy, B. I. Khazanov, A. V. Shifrin and F. K. Shuyskaya; Moscow, Kosmicheskkiye Issledovaniya, Vol VIII, No 1, 1970, pp 126-135)  
[Note: This is part of a sectionalized article "Study of Geoactive Corpuscles and Photoelectrons on the Satellite 'Kosmos-261'," Kosmicheskkiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136]

This article describes the RIE-205 scintillation spectrometer for electrons of intermediate energies, the RIP-802 scintillation spectrometer for protons and the RIG-III lead-shielded Geiger counter. The RIE-205 instrument measured electrons in the ranges 20-45, 45-85, 85-120 and 120-150 keV and the total intensity of electrons with an energy greater than 150 keV (geometry factor  $2 \cdot 10^{-3} \text{cm}^2 \cdot \text{sterad}$ ). The RIP-802 instrument measured protons in the ranges 0.30-0.45, 0.45-0.70, 0.70-0.95 and 0.95-9 MeV with a geometry factor of  $1.5 \cdot 10^{-2} \cdot \text{sterad}$ . The RIG-III instrument measured

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protons with  $E > 50$  MeV and hard electrons. In the radiation belts and auroral zones the instruments measured the fluxes and energy spectra of electrons and protons, their distribution by pitch angles and spatial-temporal characteristics. It was possible to determine the latitude variation of the intensity of injected electrons, the pitch distribution of intensity for auroral zone electrons and the differential electron spectra. For example, the electron fluxes measured with the RIE-205 spectrometer can be assigned to the following groups: a) trapped electrons in the inner zone ( $L \leq 2.5$ ) were registered for the most part in the region near the Brazilian anomaly; their flux for an energy  $E > 150$  keV attained  $10^8$  particles/cm<sup>2</sup>·sec. and was highly dependent on pitch angle; a pronounced maximum was observed for pitch angles  $90^\circ$ ; b) trapped electrons in the outer zone  $2.5 \leq L \leq 7$ , also with a maximum intensity for pitch angles of  $90^\circ$ ; in many cases quasitrapped particles were registered in the region of invariant coordinates  $h_{\min} \leq 100$  km with intensities up to  $2 \cdot 10^6$  particles/cm<sup>2</sup>·sec·sterad; c) sporadic hard electrons injected into the atmosphere in the middle latitudes; in these cases the mean energy was usually  $\sim 100$  keV and the particle flux attained  $10^5$  particles/cm<sup>2</sup>·sec; d) electrons of intermediate and high energies injected into the atmosphere in the high latitudes; they are frequently observed near the auroral zone.

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Acc. Nr.: AP0042570

Ref. Code: UR0293

JPRS 50162

Study of Geoactive Corpuscles and Photoelectrons

(Abstract: "Study of Geoactive Corpuscles and Photoelectrons on the 'Kosmos-261' Satellite," by A. D. Bolyunova, M. L. Bragin, Yu. I. Gal'perin, V. A. Gladyshev, N. V. Dzhordzhio, G. N. Zlotin, I. N. Kiknadze, R. A. Kovrazhkin, T. M. Mulyarchik, Yu. N. Ponomarev, V. V. Temnyy, N. I. Fedorova, Yu. P. Shilyayev, F. K. Shuyskaya and R. V. Shulenina; Moscow, Kosmicheskkiye Issledovaniya, Vol VIII, No 1, 1970, pp 104-136)

The artificial earth satellite "Kosmos-261" was used in a study of low-energy geoactive corpuscles and fresh photoelectrons and their interaction with the earth's upper atmosphere. The satellite was launched on 30 December 1968. Orbital inclination to the equator was 71°, so that for a relatively long time it moved almost along a tangent along the auroral zone over the Soviet Far North, making it possible to increase the volume of simultaneous measurements from the satellite and from ground observatories. The storage regime made it possible to extend continuous measurements for periods of several revolutions, including passes over the auroral zones in the Arctic and Antarctic and over the polar caps as far as invariant geomagnetic latitudes 82-85°. During the initial period the satellite apogee was at 670 km and perigee was at 217 km, but it finally

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burnt up upon entering into the dense layers of the atmosphere on 12 February 1969 after making 857 revolutions of the earth. The experiment lasted 53 days. The orbit was such that in the northern hemisphere middle and high latitudes the satellite moved below or close to the maximum of the F-region so that ionospheric electron density along its trajectory and its variations could be determined in a number of regions on the basis of measurements by ground ionospheric stations. The period of the experiment included both quiet periods and those with strong disturbances. The experiment was conducted under the "Program of Cooperation Among Socialist Countries in the Field of Space Research and Peaceful Use of Space." Ground measurements were made in Bulgaria, Hungary, East Germany, Poland, Rumania, USSR and Czechoslovakia. Observatories and special expeditionary stations in the USSR participated: in Yakutia, the Far North, Siberia and middle latitudes. The article cited below is divided into four parts: 1) Description of Experiment; 2) Measurement of Low-Energy Electrons; 3) Measurement of Low -Energy Ions; 4) Measurements of Charged Particles with Intermediate and High Energies. Parts 2)-4) are essentially independent articles and are abstracted separately.

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USSR

UDC: 621.396.74

ROMSHTEYN, R. D., BORISOV, A. S., KIRIK, G. A.

"Signal-to-Noise Ratio in Primary Wide-Band Channels Made up of n Transducer Sections"

Sb. nauch. tr. TsNII svyazi (Collected Scientific Works of the Central Scientific Research Institute of Communications), 1971, vyp. 1, pp 16-23 (from RZh-Radiotekhnika, No 3, Mar 72, Abstract No 3A18)

Translation: The authors examine a procedure for determining the numerical characteristics of distribution of the signal-to-noise ratio for communications channels consisting of n transducer sections from the known numerical characteristics of the distribution function of interference in the channel comprised of a single transducer section. Resumé.

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USSR

UDC 613.633+614.715]-07:615.47

SAVINA, A. A. and BOMSHEYN, E. M., All Union Scientific Research Institute of Labor Protection, of the All Union Council of Trade Unions, Leningrad

"Method of Clarifying AFA Filters in Determining Dust Concentration and Dispersity"

Moscow, Gigiyena i Sanitariya, No 11, 1970, pp 60-61

Abstract: AFA [analytical aerosol filters] made of petryanov filter material are widely employed. Features of the filters include: hydrophobicity (obviating the need for drying them) and resistance to chemical and aggressive agents.

Dust count concentrations (by number of particles) were determined by AFA-D-3 filters in the atmosphere and in the air of work premises. Dispersity of dust was also measured. These filters are recommended for trapping and counting dust particles in the 0.5-100 micron size range. When necessary, AFA-V-18 or AFA-V-10 filters can be used for the same purpose, with the requirement that before sampling, these filters must be pressed, for example, with a simple hydraulic press at a pressure of about 50 kg/cm<sup>2</sup>. This drives  
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SAVINA, A. A., and BOMSHTEYN, E. M., Gigiyena i Sanitariya, No 11, 1970, pp 60-61

out air bubbles in the filters. The dust increment on an 18 cm<sup>2</sup> filter (AFA-V-18) can be taken as 0.1-1 mg, depending on the dispersity of the dust.

The filters were placed on tracing cloth, covered with laboratory slide glasses, and placed in a holder. The holder was placed in a beaker containing acetone. The beaker was kept in a water bath for not more than 1 minute.

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1/2 028 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--EXPERIENCE FROM SURGICAL INTERVENTION ON SHIPS SAILING AT LOW  
LATITUDES -U-  
AUTHOR--(03)-NOVOZHILOV, G.N., BONADYSEV, N.Z., DODOCHKIN, N.A.  
COUNTRY OF INFO--USSR  
SOURCE--VOYENNO MEDITSINSKIY ZHURNAL, MOSCOW, USSR, JULY 1969, NR 7, P  
69-70  
DATE PUBLISHED----JUL70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--SURGERY, NAVAL MEDICINE, WOUND, MICROORGANISM CONTAMINATION,  
PAIN, STOMACH  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3006/1734 STEP NO--UR/0177/69/000/007/0069/0070  
CIRC ACCESSION NO--AP0135312  
UNCLASSIFIED

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PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0135312

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT LOW LATITUDES THE POST OPERATIVE COURSE OF THE DISEASE WAS CHARACTERIZED BY THE BANDAGE COVERING THE INCISION BEING SOAKED THROUGH WITH PERSPIRATION. THE INCREASED LEVEL OF PERSPIRATION WHICH CAUSES MACERATION AND LOWERING OF THE ACIDITY OF THE SKIN CREATES FAVORABLE CONDITIONS FOR THE VITAL ACTIVITY OF MICROORGANISMS AND FOR THEIR PENETRATION INTO THE INCISION. IN ORDER TO PREVENT INFECTION OF THE INCISION IT WAS NECESSARY EACH DAY UNTIL THE REMOVAL OF THE STITCHES TO CLEAN THE SKIN AND CHANGE THE BANDAGE. THE STITCHES WERE REMOVED ON THE SEVENTH TO EIGHTH DAY. MOST OF THE PATIENTS (61 PERSONS) STAYED IN THE INFIRMARY FOR 8 TO 11 DAYS; THE REMAINING ONES STAYED 12 TO 14 DAYS. THE LONGER TREATMENT OF THE 7 PATIENTS WAS IN CONNECTION WITH SUPPURATION OF THE INCISION FROM THE OPERATION. THE APPEARANCE OF SUPPURATION DURING THE POST OPERATIVE PERIOD, IN SPITE OF THE CAREFUL INDIVIDUAL ATTENTION, APPARENTLY IS EXPLAINED BY THE INFECTION OF THE INCISION AS A CONSEQUENCE OF THE INCREASED LEVEL OF PERSPIRATION UNDER THE UNFAVORABLE MICROCLIMATIC CONDITIONS. NO OTHER COMPLICATIONS WERE OBSERVED AFTER THE OPERATIONS. UPON RECOVERING THE PATIENTS RECEIVED A SHORT PERIOD OF REST AND RELAXATION AND WERE FREED FROM HEAVY WORK AND FROM STANDING WATCH. IN CONCLUSION WE FEEL THAT IT IS NECESSARY TO NOTE THAT IN ORDER TO BE ABLE TO OPERATE EARLIER IN THE CASE OF ACUTE APPENDICITIS THE MEDICAL INDOCTRINATION WORK SHOULD INCLUDE CONSTANT REMINDERS TO THE PERSONNEL OF A SHIP TO GO IMMEDIATELY TO THE MEDICAL SECTION IN THE CASE OF THE OCCURRENCE OF ACUTE PAINS IN THE STOMACH.

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USSR

UDC 615.285.7.015.4:616.1/.4-091-092.9

BONASHEVSKAYA, T. I., and TABAKOVA, S. A., Institute of General and Communal Hygiene imeni A. N. Sysin, Academy of Medical Sciences USSR, Moscow

"Morphological Changes in the Organs of White Rats Produced by Inhalation of Chlorophos in Microconcentrations"

Moscow, Farmakologiya i Toksikologiya, Vol 35, No 2, Mar/Apr 72, pp 240-241

Abstract: A 3-month long exposure to air containing 0.2 mg of chlorophos per m<sup>3</sup> causes marked tissue pathology in rats. In the lungs, capillaries in inter-alveolar septa are enlarged and alveolar epithelium is edematous. In the liver, lymphoid tissue in the periphery of lobules is enlarged, blood cells are present in perivascular spaces, and bile duct epithelium is hypertrophied. In the kidneys, glomeruli are deformed, Bowman's capsules are filled with proteins, the nuclei of tubular cells are pyknotic and the cytoplasm dense and vacuolized, and desquamated epithelial cells and hyaline casts are present in the tubular lumen. In the thyroid gland, the parenchyma is separated into islands made of 2-4 big follicles or a larger number of small follicles. The primary cause of these pathological changes is increased vascular permeability. After inhalation of air containing 1 mg of chlorophos per m<sup>3</sup>, all the morphological alterations become more pronounced. However, no pathology is observed if chlorophos concentration is 0.02 mg per m<sup>3</sup> of air.

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